THE

MEDICAL REPOSITORY.

VOL. I.—No. I.

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PREFACE.

THE *firſt Number* of the MEDICAL REPOSITORY makes its appearance under many diſadvantages. It was the original intention of the Publiſhers not to have committed it to the preſs, till communications from various parts of the United States ſhould enable them to offer an example of that method which they have traced in their *Circular Addreſs*. But it was diſcovered, that a longer time than had been expected, either by their correſpondents or themſelves, was eſſential to the due arrangement of the proper materials; and the delay, thus unavoidably occaſioned, led many, even of their friends, to ſuppoſe they had relinquiſhed their deſign. In this ſituation, it became neceſſary for them to haſten their firſt publication, that they might encourage exertions in others by this pledge of their own perſeverance. The preſent Number, of conſequence, conſiſts, almoſt excluſively, of papers furniſhed by themſelves: a circumſtance which the induſtry of many reſpectable correſpondents, (and particularly ſeveral valuable communications, received as the laſt ſheet of this Number was printing off,) encourage them to believe will not occur in future.

After this explanation of the cauſes of the imperfections of the publication now made, it may not be improper to add a few words on what may be deemed the recommendations of the plan of the Compilers to general patronage.

The zeal and activity with which medical improvements are proſecuted in Europe, is faſt ſpreading in America; and if, hitherto, our profeſſors of the healing art have been behind other profeſſional men in ſcience and induſtry, it may ſafely be

predicted, that this will not long continue their reproach. But various cauſes will probably, for ſome time, prevent them from appearing extenſively, as authors. And as medical and other ſcientific aſſociations have been but partially attempted in the ſeveral States, and where they have been, have not appeared to flouriſh with much vigour, a conſiderable period muſt elapſe before a different kind of publication, from the preſent, will be ſo generally convenient and uſeful as the depoſitary of facts and reaſonings relative to Natural Hiſtory, Agriculture, and Medicine.—Should theſe conſiderations determine men of induſtry and learning, in different parts of our country, to encourage it, it will be obvious, from the ſmallneſs of the type, the fullneſs of the page, and the moderate price at which it is afforded, that an equal portion of valuable information can no where be ſo eaſily procured. This circumſtance, though it may be undervalued by thoſe who reſide in our principal towns, who have the means of purchaſing, and the opportunities of conſulting, large collections of books, will not fail to be duly appreciated by profeſſional men, in general.—The art of book-making, as it is now practiſed in Europe, and eſpecially in Great-Britain, with the increaſing neceſſity for books, and the increaſing charges upon them, muſt leave men of moderate fortunes in abſolute deſpair of forming any conſiderable library of medical works. The periodical publications alone, where a ſhort paper is often expanded through twenty pages, when it might be compreſſed in half the number, amount to an expence that few are able to bear. The effect of this is to reſtrain the courſe of knowledge, and exclude the hope of improvement, except by the moſt tedious and imperfect of all proceſſes. But, for this evil, a remedy will be provided in the MEDICAL REPOSITORY, ſhould it meet with ſucceſs.—In addition to the original contents of each Number, it is intended to re-publiſh, in an Appendix, the beſt papers, connected with the plan of the Work, which have appeared, and ſhall, from time to time, appear in the United States and in Europe. Thoſe materials which our own country will afford for this part of the Repoſitory, will

probably be ſoon expended; but Europe offers an inexhauſtible fund; and it is evident that, with the power of ſelection, this publication may vie with any of the foreign Journals. This will be better underſtood when it is obſerved, that from the difference in the mode of printing, a hundred pages of the Repoſitory will comprehend not leſs than three hundred of any ſimilar work in Great-Britain, and at one fourth of the expence; and thus, the Appendix alone may be made to contain a volume of the ſize of the Medical Commentaries, Medical Memoirs, &c. &c.—The frequency of publication, likewiſe, will give the Repoſitory a manifeſt ſuperiority over moſt works of the ſame kind, in the opportunity it affords of ſpeedily circulating new improvements and diſcoveries; while an extenſive correſpondence, forming, or already eſtabliſhed, in various parts of Europe and America, will enable the Publiſhers, at the ſame time, to communicate the earlieſt and moſt authentic American information, to Europe; and the lateſt labours of the learned in Great-Britain, France, Germany, Italy, Sweden, &c. to America.—Time, it is true, will be neceſſary for the complete eſtabliſhment of this part of the undertaking; but of this eſtabliſhment, with the countenance of their fellow citizens, the Publiſhers entertain no doubt. The ill-ſucceſs of former attempts is all that excites any apprehenſion in their boſoms, for the fate of the preſent. But they rely on the conſiderate good ſenſe of the public, and encourage brighter expectations.

New-York, July 26, 1797.

☞ *SINCE the Eſſay on the* PLAGUE OF ATHENS *was printed off, I have been able to obtain the paſſage of* HALLER, *from which, on the authority of* DE PAUW, *I had ventured to aſſert, that the illuſtrious Swiſs conſidered that diſeaſe as an ordinary contagious fever.—See* p. 20 *of the Repoſitory.—This aſſertion is not correct—though the difference is not material to the argument.—*HALLER's *opinion is expreſt negatively, in the following words:—*"Non "putes veri nominis peſtem fuiſſe."—*Biblioth. Med. Pract.* tom. i. p. 102.—*The whole paſſage is too long to be quoted in this place.*

S.

CIRCULAR ADDRESS.

AFTER a continued struggle of many centuries, against the absurd systems of ancient physicians, and amid the difficulties repeatedly opposed to the progress of Medicine by modern hypotheses scarcely less preposterous, it has at length become established as a fundamental truth, that though conjecture may precede experiment, facts are the only rational basis of theory. Philosophers are no longer permitted to descend from generals to particulars, shaping them according to preconceived notions of their intimate relations; but are expected to proceed by a rigid examination and cautious assemblage of particulars to every general inference. This laborious process of reasoning, so favourable to truth, and so little flattering to indolence, to vanity, and to a creative fancy, requires the possession of an extensive mass of experiment, a various and judicious selection of facts;—not only for him who would overthow or construct a system, but for every one who would rightly exercise the art to which they belong. And in proportion as these sentiments have gained ground among physicians, Systems of Physic have lost much of their value; and Collections of Histories and Observations, whether the work of a single, or of many hands, have gradually obtained a high consideration and authority in the schools of medicine, as well as in the closets of practitioners. For, whatever advantages may have been temporarily derived from certain celebrated theories, it is chiefly by the new spring which they have given to the mind, and by the more accurate investigation of natural phenomena to which they have excited others, that they have been permanently useful. For our knowledge of nature is too limited, our collection of materials too scanty, to enable even the most diligent and ingenious to frame a correct theory. Medical collections, therefore, are still necessary, and must long continue to be so; and as they are free from the incumbrance of systematized hypothesis, the opinions they contain, for the most part, spring more naturally out of the facts on which they are founded, are thus less likely to mislead, and even though erroneous, as they maintain no intimate connection with an extensive scheme, still leave us, in the facts themselves, the surest guides amidst the intricacies of practice. Publications of this kind, likewise, from their very nature, possess many

advantages over systematic works. They employ a greater number of observers, over a wider field, admit of minuter details, ampler discussions, and more various opinions and recondite investigations. By their instrumentality, facts are preserved or rescued from oblivion, which, without them, had been wholly lost: for there are few men who find leisure and inclination, from the pressure of daily business, to become authors, and still fewer whose observations are so numerous and important as to demand a laboured treatise; while there are many who have time and facts to furnish out, almost every year of their lives, a short but valuable essay. And if to these arguments, in favour of Medical Collections, drawn from the nature of the works, it may be permitted to add others from the practice of other nations than our own, the example of almost every civilized country of Europe may be cited; in which publications of this kind are successfully multiplied, and sought after with peculiar avidity. But, notwithstanding the many obvious benefits resulting from them, such undertakings, in the United States, have been few, and feebly prosecuted. And this is the more to be lamented, as no country in the world is so capable of giving permanent utility to such a design. For, beside those advantages which we possess in common with other nations, there are numerous others of new and peculiar importance. These exist in our extensive territory; in the variety of its soil, climate, elevation, and aspect; in the varied descent, population, intermixture, institutions, manners, and consequent diseases, of its inhabitants; in the opportunities it affords of observing and estimating the effects of old and new settlements, of gradual and rapid changes in the face of a country, of agriculture, commerce, and navigation, of the savage, civilized, and intermediate states of society; of comparing the diseases, or phenomena of each disease, and the operation of the same remedies, in the same or different complaints, in Europe and America; in the general diffusion of knowledge, and turn for observation, among all classes of its citizens; and, finally, in the sameness and perfection of their language—an advantage possessed in the same degree by no other people.—These are privileges which should prove so many powerful incentives to medical industry; which should inspirit the exertions of physicians to give that importance, in a professional view, to their country, which, fertile as she is in occasions, she loudly calls for at their hands.

The present time seems particularly favourable to such attempts. The distressing events which have been so recently witnessed, in various parts of our country, have awakened the curiosity of others, as well as of physcians; and while they have quickened the zeal and observation of the latter, have excited the eager apprehensions of all. This has created an uncommon interest, in respect to me-

dical opinions, among the people at large, and especially since the belief of the domestic origin of certain diseases has been considerably disseminated. The partial success of a late benevolent attempt, of the kind now referred to,* is rather encouraging than disheartening; since its failure is attributable to causes not necessarily connected with the design, and since there is good ground to believe, that a little perseverance would have given it stability and reputation.—To the success of such a publication, much time, as well as the concurrent exertions of many observers, were indispensable. The field of inquiry, likewise, was comparatively narrow; and too much reliance was, probably, placed on public solicitation, with so limited a time for the collection of materials.

Influenced by considerations, and invited by views, which we have now unfolded, and shall consequently enlarge upon, we have ventured to project a work such as we have recommended, and thus publicly to solicit your assistance in its execution. And we request you to furnish us, either quarterly, semi-annually, or annually, as may best suit with your convenience, with such information, relative to all or either of the following particulars, as may be in your power.

1. Histories of such diseases as reign in your particular places of residence, at each and every season of the year; including the time of their appearance and disappearance; the peculiar customs and manners, and food of the people; local peculiarities, (not merely those of the town or village, but of the immediate residence of the sick,) preceding, cotemporary, and subsequent complaints; symptoms, progress, extent, method of cure, mortality, and what proportion of either sex, and of different ages, are affected:—in sea-ports, attention to be paid to supposed sources of importation, and to the arrival of foreigners; in new settlements, to changes in the face of the country, by clearings, drainings, &c. and to the increase of population, by immigration and otherwise.
2. Histories of such diseases as appear among *Domestic Animals*—such as horses, cattle, sheep, &c—their causes, symptoms, method of cure, &c. &c.
3. Accounts of *Insects*—whether any uncommon dearth or numbers of them; whether troublesome or noxious to men, beasts, or vegetables; with as accurate and minute notices as may be of their derivation, mode of propagation, nature and extent of such ravages, or other evils, as they may occasion; of their appearance and disappearance, and of the means, if any, of guarding against or destroying them.
4. Histories of the progress and condition of *Vegetation*—with regard to growth, vigour, and disease; independent of the

* Mr. WEBSTER'S Collection, relative to Bilious Fevers, &c.

ravages of insects; but marking the influence of manures, and the local situation, both as to elevation and soil, air and water.

5. The state of the *Atmosphere*—in respect to dryness and humidity, heat and cold, serenity and tempestuousness; including the direction and force of winds, and the sensible quantity of electricity.

Where information relative to these various topics of inquiry can be given in a connected form, it will be most acceptable; and the more minute and precise, the more useful will it be. But general and distinct communications are earnestly requested, where more extensive and combined intelligence cannot readily be afforded.

The outline now traced, gentlemen, will enable you to form some idea of the nature, extent, and importance of the work, in the prosecution of which we solicit your co-operation. The benefits which may result from such a publication, if vigorously and judiciously executed, are too numerous and considerable not to be suggested by the slightest reflection. Were it to be ably and completely prosecuted, it could scarcely fail, even in a few years, of leading us to a near view of the origin and causes of general, or febrile diseases; to the discovery of what situations, climates, and seasons, most favoured their production; of the order and rapidity of their progression, from one place to another, in the same or different countries; and of the most successful method of cure, as well as of prevention. Aided by a work composed of materials collected with such care, and drawn from so many and so distant quarters, we might be enabled to determine the relative healthiness of places; the causes why some were favourable and some unfavourable to health; their peculiar diseases, with the means of their removal and extirpation.—No plan seems more happily calculated to mark and explain the influence of different states of society, occupations, institutions, manners, exposure, air, modes of living, &c. &c. on health; and thus, indirectly, on morals, industry, and happiness: none more happily, for resolving the hitherto unexplained and difficult problem, proposed by the illustrious Sydenham,*—"whether a careful examination might *not* shew, that certain tribes of "disorders constantly follow others, in one determinate series, or "circle, as it were; or whether they all return, indiscriminately, "according to the secret disposition of the air, and the inexplicable succession of the seasons." Nor is the solution of this problem of small importance; since, in the first place, were it discovered that general diseases pursued a regular course, we might thence be prepared to receive and counteract them; or, were it

* Wallis's Sydenham, vol. i. p. 6.

determined that they depended on the qualities of the atmosphere, we should be directed to the proper object of investigation, and thus be well advanced towards a knowledge of their causes. But, whatever may be true in respect to the systematic succession of diseases, hinted at by Sydenham, it is certain that an apparent progress of a particular disease has sometimes been observable in the United States; as though the morbid principle possest the power of assimilating the atmosphere to its own nature, agreeable to determinate, but inscrutable and peculiar laws: sometimes rapidly extending, as in the *Influenza;* sometimes slowly, as in *Scarlatina.* It is perhaps difficult rightly to appreciate the benefits which the determining of a single point like this would confer on medicine; (whether by quieting apprehensions of such an extension of a disease, if indeed there were no reason to fear it; or by putting us on our guard, if such were clearly proved to be its nature)—but, whatever they may be, no method seems better adapted for ascertaining the fact, than by a publication like the one now proposed. By this means, the inquirer will be presented with a regular history of the progress of such a disease, from one extremity of the continent to the other; and be able to mark its effects in all the varieties of people, climate, and season; or, if it appear in several places, obviously disconnected, at the same time, of comparing the circumstances in which they resemble each other, and thus of determining its causes.—But, not to dwell longer on the recommendations to such a work, we may ultimately remark, that, when thus completed, the volume of every year will form the history of the health of the United States for the year preceding: a single glance of the eye will be equal to perceive what diseases prevailed at the same time, in all the intermediate situations, from St. Mary's to St. Croix, and from the Missisippi to the Atlantic; and individual experience, as well as new discoveries, will be propagated with unexampled benefit and celerity, to every part of the United States.

When we consider the extensive plan now proposed, the number of persons, and the time required for its execution, and the difficulties which always attend every work of the kind, we should indulge a presumptuous and reprehensible expectation, did we look to see it speedily and completely carried into effect. But, notwithstanding all reasonable allowance for impediments of this sort, we flatter ourselves that such materials may be collected, from time to time, as will enable us to present annually an acceptable volume to the public; while the great object of our proposed inquiries, as already explained, will gradually acquire consistence and patronage.

To the end that such a volume may be readily and regularly published, we have thought it advisable to add the following sub-

jects, to those already proposed, concerning all of which we would request information.

1. Accurate and succinct accounts of the general diseases which have formerly prevailed in any part of the United States.
2. Useful histories of particular Cases.
3. Histories of such complaints of professional men, mechanics, manufacturers, &c. as appear to originate from their peculiar employments, or the materials with, or about which they are employed.
4. New methods of curing diseases.
5. Accounts of new discovered or applied remedies, in rare or hitherto incurable diseases.
6. Extracts from rare, printed or manuscript, works, illustrative of the nature and cure of such diseases as now prevail in the United States.
7. Interesting information, relative to the minerals, plants, and animals of America.
8. American medical biography.
9. Accounts of former American medical publications.
10. Reviews of new American medical publications.
11. Medical news.

It will be obvious to every one, that the variety of subjects comprehended in this undertaking, will put it in the power of almost every other class of citizens, as well as of physicians, usefully to aid in its execution: and as the benefits which may result from its success are limited to no description of men, we are the more encouraged to solicit assistance from all whose situations enable them to afford it. We address ourselves, therefore, not to physicians only, but to men of observation, and to the learned, throughout the United States.

With respect to the mode of publication, we have not yet decided, whether to print an octavo volume annually, or to distribute the same materials into four quarterly numbers, equal to such a volume. This must be determined, in good measure, by the regularity and readiness with which we are supplied with suitable materials: and by those superior advantages for circulation which, after proper inquiry, one form shall appear to possess over the other. But, whichever may be preferred, seasonable notice will be given, and a subscription will be opened to defray the expence, when we are ready for publication; and, in the mean time, it is desired that all communications may be addressed to

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New-York, Nov. 15, 1796.

MEDICAL REPOSITORY.

VOL. I.—No. I.

ARTICLE I.

MEDICAL ESSAYS.—No. I.

INTRODUCTION.

THE design of the Papers which will be presented to the Public under this title, is to illustrate the connection subsisting between Climate, Soil, Temperature, Diet, &c. and Health. The study of the histories of those wide-wasting diseases which pass under the name of Epidemics, (if, perhaps, we except those that are thought to depend on a specific contagion, the nature of which seems hitherto imperfectly comprehended,) is calculated to excite a suspicion, that they all have one common origin; arise in circumstances nearly similar; and assume those varieties from which they obtain their several denominations in consequence only of varieties in the number, force, combination, season, and application of those circumstances. Should a minute inquiry into every thing which relates to these pestilential maladies justify such a suspicion, we should, probably, discover their hitherto hidden cause, and be enabled to prevent its future operation. And, though the immediate principle of contagion escape our researches, the benefit resulting from such investigations will scarcely be less real, if they lead to a discovery of those circumstances which are necessary to its generation and influence.

It was, originally, the intention of the writer to compose a connected series of Essays, which should exhibit, in chronological order, a successive view of those epidemical diseases which desolated the ancient, and continue to spread devastation over the modern, world. But this is found to be impracticable. Of the slender

memorials handed down to us from antiquity, relative to the epidemics of those times, few, comparatively, are to be found in the United States. Of those few, this city possesses a very small and inadequate share; while our libraries are equally deficient in those writings of the moderns which might best supply their place. Those who have not considered this difficulty, and European writers in particular, can never sufficiently appreciate it. While they have free and ample recourse to originals, we are restricted to the more doubtful and unsatisfactory use of translations, compilations, and excerpts,--often erroneous in their attempts to convey the meaning of the author, or imperfect from their brevity, or perverted in their application.—But, notwithstanding the embarrassments which perpetually arise from this source, the writer is induced to believe, that, from the following essay, as well as such others of this collection as shall relate to ancient plagues, some benefit will result, if the patience of the reader keep pace with his own. For, though, in respect to these diseases, we may often be left in the dark as to particular symptoms, and modes of medical practice, yet memorials sufficient remain to indicate, in a satisfactory manner, the general causes of the diseases themselves.

In the composition of so much of the present Essay as relates particularly to the Athenian Pestilence, the authority of Thucydides has been principally relied on. Frequent reference will be found, in the first section, to the Philosophical Dissertations on the Greeks of the ingenious M. de Pauw, in the fidelity of whose quotations it has been necessary to confide more than was to be desired. But as the reader is always carefully directed to every authority, whether original or otherwise, it is hoped that no mistake will arise which may not readily be corrected. The writer ventures to believe none will be found to invalidate the inferences which seem to flow most naturally from the succeeding statement of facts. The elaborate commentary of Utinensis (a quarto of 600 pages,) on that part of the history of Thucydides which relates to the plague of Athens, mentioned by Mr. Gibbon in his history, is not to be found in America; and all the difficulties, in respect to original writers, spoken of above, particularly embarrass the subject of the present inquiry.

Hereafter, these essays will be continued at such intervals as may best subserve the purpose of the publication of which they are to form a part; and never to the exclusion of more interesting communications.

E. H. SMITH.

June 25, 1797.

THE PLAGUE OF ATHENS.

SECTION I.

IN the third year of the 87th Olympiad, answering to the 430th preceding the christian era, a plague broke out in the city of Athens, which, for its severity, duration, and the mortality it occasioned, exceeded all which, before that time, had been known to the Greeks: For it inflicted the most dreadful pains on all who experienced it; spared neither age, nor sex; destroyed near 5000 of the flower of the Athenian armies, with an immense multitude of the poor; and did not disappear till after it had exercised the most unexampled cruelties, for a period of little less than five years, and reduced the powerful republic of Athens to the very verge of ruin and despair.

Attica, of which Athens is the capital, is a small state, situated between the 37 and 39th degrees of north latitude, and comprehending a territory, the extent of which, though variously estimated, is on no computation very considerable.* Its figure is a triangle, having its two sides washed by the sea, and its base united to the continent. The face of the country is exceedingly broken and diversified by high, rugged and irregular mountains, contrasted with deep, winding, and pent up vallies.

The streams by which it is divided, are remarkably rapid; swelled in the spring, by the dissolution of the snows which crown the mountains; but shrunk up, by the excessive heat of the summer: resembling, in this respect, the Lehi and other rivers of Pennsylvania and the southern states.

The lower extremity of the Attic peninsula was, and continues, remarkably barren; being chiefly composed either of bare rocks, or desert sands. Towards Athens it assumed a more lively appearance; where the assiduous hand of cultivation intermingled the olive, the vine, and a variety of plants, with the firs and other evergreens that naturally ornamented the summits of the hills. But of other woods they were nearly destitute; so that, at the period of which we are speaking, fuel was both scanty and dear.

The soil of Attica, light and poor, produced no other grain than an indifferent barley; and the country was unfitted, no less on this account, than from its small extent, for pasturage. Eubea, and the neighbouring parts of Greece, furnished the Athenians with their meats; while their ships supplied them with wheat

* The Abbé Barthélémi makes it 66 ſquare leagues. Voy. du J. Anachar. chap. vi. M. de Pauw computes it to equal 250 ſquare miles. Philoſ. Diſſert. on the Greeks, vol. i. p. 3. Tranſlation. Edit. London.

from distant countries, but chiefly from the borders of the Euxine. The constant demand for grain at Athens, gave rise to a multiplicity of municipal regulations, frequently evaded by a spirit of speculation not unworthy, either for ingenuity or eagerness, of the present times; while the imperfect supply of better meats conferred a value on many kinds of flesh, birds and insects, at which modern delicacy would sicken.* Even at the present time, if we may credit the assertion of a late traveller,† no other flesh but that of goats is to be found in the Athenian markets. This defect of animals proper for food, created in the people of Attica an habitual preference of vegetables; and, conspiring with the meagerness of the soil, produced a state of cultivation unequalled in any country now known, if, perhaps, in deference to the testimony of Kæmpfer and Thunberg, we except Japan. The olive and the vine which flourish in a thin soil, were naturalized; earth was carried from the vales and deposited upon the hills; walls were constructed to support it there, and prevent its being washed down by the rains; and by contrivances not different in effect from our hot-beds and green-houses, the markets of Athens were regularly and daily supplied with fresh vegetables, even during the severity of winter. Nor was the industry of the people restrained to the securing of a steady sufficiency of the necessaries of life. Luxury and taste, which found little to gratify them in the meal, presided over the desert; not esculent plants alone, but the myrtle, the rose, and other flowering shrubs, were assiduously reared; and a winter entertainment in Athens, regaled the smell with fragrance, the eye with blossoms, and the taste with fruits of delicious flavor.

But, though industry and art could remedy the defects of soil, nature had been equally parsimonious, in another respect, where they could not prevail against her. Athens and Attica were poorly supplied with water. Their streams were brackish, impregnated with minerals or with salt; and the people were obliged to have recourse to pits and cisterns, to preserve that water with which they were scantily supplied by infrequent rains. For, beside that the air of Attica was, in general, exceedingly *dry*, plentiful rains were only known to happen when the *hellespontias*, or north-east wind, prevailed.‡—The climate of Attica bears a striking resemblance to that of many of the United States. Its latitude being nearly the same, variations could only depend on local cir-

* De Pauw, sect. xi. chap. 3.

† Travels through Switzerland, Italy, and part of Greece, &c. in 1787, 1788, and 1789, by Thomas Watkins.—London, Cadell, 8vo. 2 vols.

‡ De Pauw, chap. 10, vol. i. part 1.—It may be proper once for all, to inform the reader, that the chapters of De Pauw, which have been particularly consulted, are the 2d, 3d, 8th, 10th of section i. and the 6th, of section ii.—Other parts of the work are occasionally referred to.

cumstances. From the broken face of the country, we should naturally expect to find the seasons tempestuous; and from its nearness to the sea, the weather changeable. Both of these were true; but the snowy heights of the numerous surrounding hills, and the long chain of mountains which reached quite across and almost buried the adjoining kingdom of Thrace, preserved a more steady and severe cold in winter, than on the sea-coast; and a more uniform and suffocative heat, in summer. The north-west winds, which came from the icy summits in the cold season, were piercing; and the sultry and confined vales, when agitated by any breeze in the warmer months, seemed to have borrowed their gales from the deserts of Africa.—So excessive was the cold of the neighbouring states of Bœotia and Phocis, though both in a latitude lower than Norfolk in Virginia, that the Bacchantes nearly perished in a snow-storm, in the former; and an army, from the confines of Germany, were unable to sustain the rigors of a winter campaign in the latter.*

* De Pauw, chap. 10 ſection i.

The following paſſages, from the "Works and Days" of Heſiod, a poet who reſided at Aſcra, a village in the neighbouring country of Bœotia, and but a few leagues from Athens, ſerve to confirm this account of the climate of Attica.

"The month all hurtful to the lab'ring kine,
In part devoted to the god of wine,
Demands your utmoſt care;* when raging forth,
O'er the wide ſeas, the tyrant of the north,
Bellowing through Thrace, tears up the lofty woods,
Hardens the earth, and binds the rapid floods.
The mountain oak, high tow'ring to the ſkies,
Torn from his root, acroſs the valley lies;
Wide ſpreading ruin threatens all the ſhore,
Loud groans the earth, and all the foreſts roar:
And now the beaſt amazed, from him that reigns
Lord of the woods, to thoſe which graze the plains,
Shiv'ring the piercing blaſt, affrighted, flies,
And guards his tender tail betwixt his thighs.
Now nought avails the roughneſs of the bear,
The ox's hide, nor the goat's length of hair,
Rich in their fleece, alone the well-cloth'd fold,
Dread not the bluſt'ring wind, nor fear the cold.
The man who could erect ſupport his age,
Now bends reluctant to the north-wind's rage."

* * * * *

"Now does the boneleſs polypus, in rage,
Feed on his feet, his hunger to aſſuage;
The ſun no more, bright ſhining in the day,
Directs him in the flood to find his prey;
O'er ſwarthy nations, while he fiercely gleams,
Greece feels the power but of his fainter beams.

* This anſwers to the month Nivoſe of the new French calender.

Sometimes a sudden and severe frost destroyed even the roots of the vines and the trees.*

The winter sat in very early in Attica. The cold winds began to prevail about the autumnal equinox; when the north-west, in particular, seemed to descend, fraught with chills, perpendicularly, on the city of Athens. Its greatest height was about the first of February—nor has the climate undergone any change since the time of Pericles, in those particulars, as appears from the publications of Riedesel and Wheeler†—the last of whom was prevented from visiting the top of Mount Hymettus, by the snows in February, and found his woollen clothes scarce sufficient to protect him against the cold of the vallies. The narrow and rapid streams of Attica and Peloponnesus were seldom fastened by ice, notwithstanding this rigorous winter; but the broader rivers of Thrace, a country situated in a much warmer latitude than New-York, were frozen over like the Connecticut and the Hudson.

It resulted, necessarily, from this variety of seasons, that a great difference existed between the summer and winter dress of the people. In the cold season, it was difficult to clothe too warm; in the warm season, to go too thinly clad. The Athenians, in summer,

> Now all things have a different face below;
> The beasts now shiver at the falling snow;
> Thro' woods, and thro' the shady vale, they run
> To various haunts, the pinching cold to shun:
> Some to the thicket of the forest flock,
> And some, for shelter, seek the hollow rock."
>
> Cooke's Hesiod, verse 175.
>
> "When with their domes the slow-paced snails retreat,
> Beneath some foliage, from the burning heat," &c.
>
> Cooke—verse 256.
>
> "The season when the dog resumes his reign,
> Weakens the nerves of man, and burns the brain.
> Then in the shade avoid the mid-day sun," &c.
>
> Verse 270.

The description of winter would well apply to the northern boundary of the United States; and the direction in the last line of the last quotation is well adapted to the climate of Georgia and the Carolinas.

* Theophrastus—De Causis Plantarum, lib. v. quoted by M. de Pauw.—Instances of this kind are frequent in our own country. I have known such a frost near the city of New-York, in June; and a snow-storm happened in the May of 1760, after the apple-trees were in blossom; and another in May, 1774.

† Observ. sur le Levant, par M. Riedesel. Wheeler's Travels in Greece, vol. ii. both cited by De Pauw, but neither to be found in the New-York and Philadelphia libraries.—The accounts of these gentlemen do not seem perfectly to accord with that of Mr. Watkins, unless we are to suppose the winter in which he was at Athens, unusually moderate. He was there in December, 1788—when he says, "the season which is particularly severe at Constantinople, is here open." Perhaps the greatest cold happens after December, at Athens, as appears to have been the case at New-York, for some years past.

rambled about, and performed their exercises, nearly naked, in their extensive porticoes and public groves. In the winter, they wrapped themselves up in woollens, and shrunk into their close, confined, and heated rooms.* Even their nice sense of the graceful in attire yielded to the imperious mandates of the season; and the actors of their theatres, as well as the spectators, covered themselves with a fleecy mantle. The women, alone, with that pertinacious regard to external appearance, which has been little weakened by time, were remarkable for a light dress, ill-suited to protect them from the terrors of the winter. But their recluse and sedentary lives did not so much expose them to its influence, as the active habits of the men, who monopolized, at the same time, business and diversions.†

To causes already enumerated it may doubtless be attributed that the principal part of the food of the Athenians consisted of vegetables.‡ Even at the tables of the rich, their scanty and minute dishes of meats, which formed the first course, or the meal, were soon removed, to make way for fruits of every flavour, the rich olive, the delicious grape, and the honey of Hymettus.§ To the poor this slender supply of flesh was denied, as beyond their means to procure; and, except at their public feasts, we may

* Hesiod, in the Poem before cited, gives the following directions for a winter dress.

"A winter garment now demands your care,
To guard the body from the inclement air;
Soft be the inward vest, the outward strong,
And large to wrap you warm, down reaching long:
Thin lay your warp, when you the loom prepare,
And close to weave the woof no labour spare.
The rigour of the day a man defies,
Thus cloth'd, nor sees his hairs like bristles rise.
Next for your feet the well-hair'd shoes provide,
Hairy within, of a sound ox's hide.
A kid's soft skin over your shoulders throw,
Unhurt to keep you from the rain or snow;
And for your head a well-made covering get,
To keep your ears safe from the cold and wet."

Works and Days, v. 215.

† To this recluse life of the Athenian women Hesiod alludes in the following lines—" Works and Days, v. 195.

" ——————— the tender maid,
Free and secure, of storms nor winds afraid,
Lives, nurtur'd chaste beneath her mother's eye,
Unhurt, unsully'd, by the winter's sky."

In addition to De Pauw, consult Voy. du J. Anachar. chap. xx. and Potter's Grecian Antiquities, B. iv. chap. 13.

‡ Potter's Antiquities, B. iv. chap. 18.

§ Watkins, in 1788, enumerates " rice, dried figs, olives, honey of Hymettus, and rich milk"—among the delicacies which Athens afforded, to compensate him for goat's flesh, few roots, and bad bread.

presume, they rarely tasted it. On these occasions, indeed, they indulged in gluttony and drunkenness without restraint.* Nor were the private entertainments of the Athenians always more becomingly conducted.* Women, as well as men, at certain feasts gave way to the most disgusting intemperance and disorder; as if resolved, at such times, to avenge themselves, by the extent and violence of their debaucheries, for that general state of dependant insignificance to which they were subjected.* But such opportunities occurred, neither for them nor for the people at large, so often as to have any permanent influence on their health. Their vegetable diet was mostly persisted in. Roots and fruits abounded in the winter; honey they always had; and the dried grape was then substituted for the fresh. Thus a steady succession of garden vegetables, of fruits, and even of flowers, became essential to the Athenians; and a failure in quantity, or a defect in quality, tended to excite commotions and insurrections in Athens, as certainly as like circumstances in respect to bread in Paris. But frugal as they were in time of peace, in war they were obliged to submit to still greater frugality, and a less agreeable fare. The subsistence of the Athenian armies consisted of salted meat, particularly fish, dried fruits, cheese, olives, onions, and an inferior species of barley.† Nor were the poorer citizens of Attica better provided. Pent up either in their boroughs, or in the capital, they were restricted, at once, from their accustomed supplies, which the rich only could draw from their extensive gardens: for the Athenians held a feeble face on the land side; and their territory was frequently left, undefended, to the ravages of a merciless invader. Nothing could exhibit a more striking and immediate change in the ordinary food of the people, than the preparations for war. Yet, how great soever were their sufferings, and though commotions succeeded commotions, their vanity and ambition, their numerous spectacles at home, and their splendid victories abroad, deceived them of their sorrows, and elevated them above their misfortunes.

Domestic slavery existed, in full force, throughout Greece. In Attica the generous temper of the people mitigated its severity; and, if we except the wretches who were doomed to labour in the mines, the slaves were treated with mildness and indulgence. This might be the more necessary, as they greatly exceeded their masters in number, and were employed on all public works, and sometimes in the armies. The number of slaves in Attica is estimated at 400,000; and it is not probable that the citizens of the Republic, together with strangers resident in the Athenian territory, exceeded 100,000, including women and children The permanent

* See Voy. du J. Anachar. chap. 25. De Pauw, sect. iii. chap. 2. Potter, B. iv. chap. 20.

† Potter's Antiquities, B. iii. chap. 4. De Pauw, sect. ii. chap. 3.

houses of Athens and its suburbs are computed by Xenophon, to amount to 10,000; and when we consider that most of them were mere cabins, we shall not think the residents of that city more numerous than 50,000: which is the estimation of De Pauw. The remainder were inhabitants of the neigbouring boroughs; employed in the mines; and scattered over the face of the country. Fifty thousand people, therefore, may be supposed to have steadily resided in Athens, in time of peace. And it is the more material to obtain correct ideas on this point, as very important deductions will be found irresistibly, to flow from its establishment.

The extremity of the Attic peninsula seems to have been little susceptible of tillage. Its chief population consisted of the slaves employed in the silver mines of Laurium, and the persons concerned in their superintendence. Northward, and to the north of Athens, the whole country was covered with orchards and vineyards. It was in the country that the wealthy and luxurious Athenians most delighted to dwell. For while the private buildings of the city exhibited an appearance of meanness and wretchedness below that of our most miserable frontier towns, every decoration that architecture, sculpture, painting, gardening, and planting would bestow, was expended on the villas of the rich. As in European countries, their plantations oftentimes extended several miles in circumference; while the poor possessed not a foot of earth. Yet the superior wretchedness of the city poor, attached the country people to their habitations, where they were universally more comfortably settled, and led more tranquil, healthy, and independent lives.

Such was the general condition of Attica, and the Athenian people: but the city of Athens, the seat of the severe calamities which were brought upon the nation by the Plague, demands a more particular consideration.

The city of Athens, situated on the left side of the peninsula of Attica, and built almost on the border of the Saronic gulf, lies in north latitude 38 deg. 5 m. or nearly that of Norfolk in Virginia. This place, afterwards so celebrated, at first consisted only of a few miserable cabins, erected on the top of a rock, in the midst of an extensive plain. As the number of inhabitants increased, the surrounding plain became settled: the original city was devoted to the gods, and was called Acropolis, or the Citadel; while the rest of the settlement was denominated the Lower City. The Citadel was inclosed in a proper wall; and a wall, common to that and to the lower city, surrounded the whole. The population and commerce of Athens extending, the city extended with them; and by means of the Long Walls, which reached to the sea, was made to comprehend three harbours—the Piræus, Munychia, and Phalerum.

The *Citadel*, if perhaps we except the ministers and servants of the temples, contained no inhabitants. Nor does it appear to have been visited by the plague.

The *Lower City*, like most of the cities of modern Europe, and many of our own, was settled without regard to any plan. Each person regulated the position of his house by his own particular notions of convenience; and thus, while in some quarters the buildings were huddled together, in others large places were left unlocated.—The circumference of the city, or the space comprehended within the wall, was about seven miles. This extent of territory, though much more considerable than was necessary for the accommodation of the proper inhabitants, afforded them little advantage; for scarcely a third was built upon. A large portion of it, the Marshes, was unfit for use. Some parts were rocky; others covered with groves, and devoted to particular exercises; and many places, the best adapted for building, were left desolate. For, when any citizen was convicted of treason, the laws directed his house to be razed, his grounds to be laid waste; and forbade the erection of other buildings, and the prosecution of further improvements, on the places. This sentence, it is true, was sometimes reversed by particular rulers; but, at the time now treated of, many such vacant spots were left. Of these, the *Pelasgic* was one, and probably the most extensive; and its settlement was specially prohibited by the Oracle.—But a further reason for leaving so much ground unoccupied, was for the accommodation of the country people, who, in time of war, were obliged to take refuge within the walls of the capital. Here they erected, without any order, their temporary and wretched huts; leaving their fields to be desolated by their furious adversaries.

Marshes and stagnant water were, by no means, confined to the city. Much of the road to the harbours was marshy; and the Ilyssus and Cephisus wandered through the extensive marsh of Phalerus, which lay directly south of and near the lower wall, leading to the harbour of that name.

The northern and eastern environs of Athens, partook of the same misfortune. The Academy, where the celebrated school of Plato was kept, suffered severely, in consequence. That philosopher himself, many years after the plague, and when much labour and money had been expended to render the situation healthy, was made sick by the dampness of the air, and obliged to remove to the higher country of Colonna. Nor was the Academy more salubrious from the vicinity of an extensive burying-ground, on one side; numbers of tile-kilns, on the other; and the rows of thick planted trees, (a common fault in Athens)—which excluded the sun, and prevented a free circulation of the air.—Within the city, this was not the only obstacle to due ventilation. The nume-

rous streets of the inhabited quarters were narrow, irregular, unpaved, and worse built than any of the towns in the United States. The public buildings alone excelled those of other countries for elegant magnificence, rendered more striking by contrast with the uniform meanness of those by which they were surrounded. For it was the policy of the government to discountenance private expence in building; and the Areopagus sat the example of this rigid and baneful simplicity, by holding their own assemblies in a house whose cieling was of clay.—The wealthy fled into the country, where they rioted in luxury at their superb villas; but the regular citizens were obliged to submit; while the poor were consoled by constant employment in constructing and beautifying the national edifices, whose splendor, equally shared by rich and poor, gratified their vanity and elevated their pride. Their own dwellings, indeed, were little better than the wigwams of our savages; few of the rich had houses of more than a single story; and where upper apartments were added, the second story projected into the street, and was ascended to by stairs on the outside.*

The number of houses in Athens has been already stated at 10,000, exclusive of temples, other public edifices, and manufactories. These last were numerous and extensive. A whole square was devoted to the cabinet-makers; another to sculptors; and several to the workers in metals.

The following facts may serve to convey some idea of the ordinary cleanliness of Athens.

The people, it has been noticed already, ate but sparingly of meat. Most of their cattle were offered up as sacrifices to the gods. Sometimes the victims were portioned out among the assistants; sometimes a feast succeeded, when the limbs, half consumed, were wantonly thrown about the streets; sometimes the blood and entrails were burnt, and thrown into a ditch; but oftener they were left undisturbed, or unburied, at the places of sacrifice; and this was so common, that some parts of the town must have borne a near resemblance to a slaughter-house.—To these circumstances, De Pauw, with great probability,† ascribes it that Athens was

* In many European towns, and even in London so late as the year 1784, and probably later, the same fact has been observed. In the narrow streets where this manner of building prevails, the tenants of the lower stairs never feel the sun, or see him shine. Those who live in the upper rooms can shake hands, across the street, and from their front windows.—Is it surprizing that these places are rarely free from low fevers?

The present town of Athens is as badly built as ever, according to Mr. Watkins; and its population reduced to about 5000 people; others say 10,000.

† Compare this with Mr. Bruce's account of the city of Gondar, in Abyssinia. The hyænas enter Gondar, in the night, to prey on the remains of slaughtered animals, which lie in the streets.

perpetually infested with wolves.* The rewards offered for the destruction of these animals were insufficient while the cause remained; nor are they extinct, if we may believe a modern traveller,† at this day, in the vicinity of Athens.

From the south-western gate of Athens, two walls took their rise; the southernmost of which extended, about 3½ miles, to Phalerum; the northernmost, about 4 miles, to the Piræus. Between these two ports, but nearest Phalerum, lies Munychia; which, by means of a third wall, near seven miles in length, conformable to the windings of the margin or beach, was included with them. Thus these three walls, the two former of which were called the Long Walls, formed a triangle, whose irregular base was on the sea, and its narrow apex at the wall of the city. The extent of Athens, if determined by the walls which inclosed as well the town as the ports, is estimated at 22 Attic, or about 17 of our miles.

At the time of the plague, the *Piræus* was the principal port; though all three were in constant use. Here the vessels and ships of war were built, victualled, refitted, and stationed. Here all commodities were shipped and received from abroad. These, and the borough of *Piræus*, which was situated between that port and Munychia, were the receptacles of their seamen, of residentiary and trading strangers, of manufacturers and artisans, of all employed in traffic and the labours of the ports, and of the many wretches which commerce and navigation never fail to create. The harbour and town of Piræus were very populous. Three docks distinguished the former; and an extensive portico, composed by the union of five inferior porticoes; two forums, one near the sea, and another towards the city; a spacious mart, the resort of all the trading nations; and a prodigious arsenal; ornamented the latter. From hence to Athens was about four miles, over a marshy road; the width of which, between the walls, was near ½ a mile at Piræus, and about 50 rods at Athens. So small and confined was this ancient emporium of commerce; and when we recollect the inferior size of vessels at the time of which we are speaking; when we bear in mind the assertions of late travellers, who maintain that this port would not afford anchorage for fifty modern ships;‡ when,

* "She (Greece) breeds the ravenous wolf, the bear, the boar,
Pernicious monsters!" Fawkes' Theocritus, idyl. xxv. l. 201.

"Any one who brings in an he-wolf, shall have five drachms, and for a she-wolf, one." Law of Solon. Potter's Grecian Antiquities, vol. i. page 167.—In the time of Xenophon, the hunters alone were allowed to pass the line of defence, in time of war, in order to destroy bears and wolves, which would otherwise desolate the country. De Pauw, sect. ii. chap. 6.

† Spon. Voyage de la Greece.

‡ "Description of the Gulph of Venice and the coasts of the Morea," by M. Bellin—referred to by De Pauw, sect. ii. chap. 6.

Watkins, vol. ii. p. 279. says that Phalerum is "so shallow that a large

too, we remember the immense crowd of people who actually resorted there in times of peace, and the navies fitted out by the Athenians, in the Peleponnesian war; we shall have some idea of the confusion, mixture, and miserable accommodations which the residents of that quarter submitted to, in its ordinary state of population.

The Athenians in general, if we except the regular inhabitants of the town, were remarkably attached to a country life. Neither the splendid ceremonies, nor the enchanting spectacles, of the city possessed sufficient allurements to entice them from places where they acted without restraint, and indulged in exercises equally conducive to health and pleasure. The rich were more luxurious, and the poor better provided for. This tranquility and enjoyment had been interrupted by the Persian invasion; but, after the liberties of Greece had been asserted and secured, the Athenians re-settled their territory; beautified it with new groves and villas; covered it with their wooden huts; and spread an ample and luxuriant vegetation over all its fields. Such was their situation at the commencement of the Peloponnesian war.

Differences had subsisted between the Spartan and Athenian republics, for a long time. Negociation had been ineffectually resorted to, for their accommodation, till at length, Athens, by the persuasive and irresistible eloquence of Pericles, was led to a declaration of hostilities. The Spartans and their confederates were powerful by land; the Athenians by sea. The former trusted to their armies; the latter, to their fleets. It was their usual practice to leave their frontiers unguarded, and, at the alarm of war, retreat within the city and the walled boroughs. A similar conduct was recommended to them, by Pericles, on the breaking out of the present war, in the year 431, preceding the christian era. But, though they followed his advice, from a conviction of its propriety, yet never was a removal attended with circumstances more melancholy, and regrets more poignant. The people had just become comfortably settled, and the country beginning to respire, after the defeat of the Persian invaders. These pleasant accommodations, and these rural scenes, passionately beloved, they were forced to relinquish, unprovided with shelter in the city, from which in times of the greatest prosperity they hastened to depart, and where they were now to seek their sad and reluctant refuge. They were obliged, with their own hands, to pull down their new-built houses, and to abandon the fields, tilled by themselves, to a merciless and de-

barge could not float in it"—and Munychia is in the same condition. If another remark of this writer be accurate, vol. ii. p. 293. that "the soil of Athens is from 12 to 18 feet higher than it originally was," it will appear that some considerable change has taken place in the capacity of these ports. That an alteration has been effected is evident by the circumstance of the channel both of the Ilyssus and Cephysus being dry. See p. 304 and 310 of the same work.

solating enemy. Nay more, to forsake "their temples, which, "from long antiquity, it had been their forefathers' and their own "religious care to frequent;" "to quite alter their scene of life, "and each abandon as it were his native home. When they were "come into the city, some few had houses ready for their reception, "or sheltered themselves with their relations. The greater part "were forced to settle in the less frequented parts of the city, in "all the buildings sacred to the Gods and Heroes, except those in "the citadel, the Eleusinian, and any other from whence they were "excluded by religious awe."* So urgent was the necessity, that, contrary to the express prohibition, as it was supposed, of the Pythian oracle, they seized upon the interdicted ground of the Pelasgic, and erected there their miserable huts. Set up wherever space was found, in the utmost disorder, and prest together, they experienced no free circulation of the air; while their diminutive size provoked the sallies of a sarcastic poet,† who compares them to butts or casks. When the Pelasgic was fully occupied, there was not yet sufficient room for the new-comers. "The city," says Thucydides, "was not able to receive so large a conflux of people." "Many were forced to lodge in the turrets of the walls, or wherever "they could find a vacant corner." "Afterwards the Long Walls, "and a great part of the Piræus,‡ were portioned out to them, for "little dwellings." "Some," he remarks in another place, "had "no houses, but dwelled in booths, where there was scarce room "to breathe." "At the same time, they (the Athenians) were "busied in the military preparations, and fitting out (at this very "Piræus) a fleet of one hundred ships, to infest Peloponnesus." This was in the spring of the year 431; the flocks and labouring cattle had been previously sent over into Eubea, and the neighbouring islands; and the harvest was left standing. By this removal, the population of Athens was augmented from 50 to more than 400,000; all supplies of fresh meats were at an end; the city was in a state of blockade, dependent for its vegetable nutriment on the importations and hoards of the preceding year, and the scanty product of the fields in its immediate vicinity.

Such was the situation of Attica and the capital, when, "in "the height of summer, and when the harvest was ripe," the Spartans and their confederates broke into the Athenian territory, and laid it waste even to the walls of Acharna;§ which they closely

* Thucydides, B. ii. Smith's Translation.

† Aristophanes.

‡ i. e. The streets, market-places, porticoes, &c. of this borough, were partitioned off, into little rooms, for the families from the country.

§ Acharna was about six of our miles from Athens; and contained, at this time, 3000 fighting men. Beside this, there were several smaller towns, also garrisoned, and in the same condition as Athens and Acharna, in respect to supplies.

besieged. But the southern extremity, and most barren part of the Attic peninsula, protected by the fleet, escaped this year. Thus were the principal supplies of Athens, for the ensuing year, totally destroyed. Nor were the people shut up within its walls, insensible to this calamity. A scene like this they had never witnessed before; and its horrors were magnified by their apprehensions of famine; by their grief on quitting their fields and dwellings; by their resentment against the actors in it; and all were heightened by the earnest entreaties of the Acharnians, to sally out, and repulse the enemy. Commotions and insurrections followed; the courage and conduct of Pericles were loudly arraigned; and it required the utmost efforts of his address and eloquence, and the full weight of his popularity, to restrain the disaffected.

When the Peloponnesians had withdrawn from Attica, the Athenians, as if it were to leave no possibility of supplies, for themselves or others, on the north of Athens, marched into the adjacent country of Megara, and subjected it to similar devastations.

Those who remember the desolation effected under the orders of the celebrated Marshall Turenne, or the more recent horrors of the Vendée, will have some suitable notion of the condition in which Attica was left by the Peloponnesians. Neither fire, nor sword, was left unemployed, in this terrible war against the harmless earth; vines and fruit-trees were wholly destroyed; the government of Sparta encouraged its rapacious soldiery; and "nothing was left to the vanquished but their temples and their tombs."*

The Athenians past the first winter of the war, pent up within their city, discontented, and unhappy; in part, supported by their naval strength, and cherishing the vain hope that their enemies would not renew their depredations; or, at least, not to the same degree.

Early in the ensuing spring (of 430, A. C.) the Peloponnesians made a fresh incursion. Whatever had escaped before, or had since grown up, on the north and west of Athens, was now utterly laid waste. They were busied in this work, when the Plague, about the last of April or beginning of May, suddenly appeared in the Piræus; and afterwards, during the same summer, extended over the whole city.—The Peloponnesians, having completed their ravages in all the Attic territory, above Athens, fell upon the southern parts of the peninsula, and rendered them equally desolate. Thus, to use the words of Thucydides, "they made the whole country one continued devastation."—If the Athenians who had removed into the city were before afflicted, all their sorrows were now redoubled. Nor could the talents of Pericles,

* Scholiast of Demosthenes, on the "Discourse against Timocrates," quoted by De Pauw, sect. i. chap. 8.

which prevailed upon them to continue, and which directed the efforts of the war, re-animate their spirits amid such unexpected calamities.—"The poor citizens who had but little, could not bear, with patience, the loss of that little. The rich and the great regretted the loss of their estates, with their country-seats, and splendid furniture."*

Meantime, the plague continued to extend; and prevailed, with great mortality, the whole of the years 430 and 429. However, in the last of these years, the country respired a little. The enemy made no ravages, and Athens had opportunity to gather in her vegetable harvest. This was followed by an abatement of the plague, during the following year, 428.—In the summer of that year, and "when the corn was full-grown," the Peloponnesians entered Attica. But the Athenian horse and light troops kept them off; and, by means of repeated skirmishes, defended and protected "the parts adjacent to the city." This allowed the people to gather a second, but more scanty harvest; and they past the succeeding summer, with a further exemption from the plague; which, however, had at no time deserted them.† But, in the autumn of 427, and about the equinox,† it broke out afresh, and with augmented violence. As a precursor to this severe calamity, their enemies, the preceding summer, had renewed their depredations, with such success as to be necessitated to retire from the Athenian territory, for want of forage for their horses.—The year ensuing, (426) the plague raged with unexampled fury and mortality. But this was the limit of its power. Causes, hereafter to be investigated, operated to deliver them from its dominion; and the incursions of their hostile neighbours now ceasing, health was restored to Athens.

The relation apparently subsisting between the plague of Athens, and the state of the citizens, in respect of vegetable supplies, is too curious and important to be lightly passed over; and will be best exhibited by the following table, for the introduction of which it seems unnecessary to offer an apology.

Attica ravaged, and the vegetable supplies cut off, in the summer of	431, A. C.
The plague breaks out in the spring of	430
The ravages renewed and extended, in the summer of	430
The plague at its height in	429
No devastations in	429

* Thucydides, B. ii.

† The New-York fever of 1795, though it commenced the last of July that year, was nearly extinct on the fourth of September; but revived about the 15th, and increased in mortality till the middle of October. The greatest mortality of the fever of Philadelphia, in 1793, was in October; nor did the winter entirely banish all symptoms of the disease.

No plague—or but very little, in 428
Depredations in the latter part of the summer, but not so extensive as formerly, in 428
The plague holds off all summer, but recurs in autumn 427
The ravages more extensive than ever, in 427
The plague worse than ever, in 426
Tempestuous season, &c. obliges the Peloponnesians to retire, without committing any depredations, in 426
No recurrence of the plague either in 425
or after.—The Peloponnesians were in Attica but fifteen days this year, (425) in which time they had opportunity to inflict very little injury on the country.

SECTION II.

THE preceding narration of facts has prepared the way for the discussion of a question in relation to the disease under consideration, which has always given rise to great variety of opinion, and been deemed of much importance, in the history of Epidemics—Whether the Plague was imported, or of local origin? As no certain evidence is left to us by the ancients, on this interesting point, we are necessitated to have recourse to the exercise of our own judgments, on a comparison of all the circumstances connected with this memorable calamity. It, indeed, appears, from Thucydides, that a report prevailed in his time, that the Plague originated in Africa, and was imported into Athens. But, from the manner in which this report is noticed by the historian, it may be inferred that he thought it entitled to very little credit; for he declares that the disorder fell suddenly on the people of the Piræus, so that it "occasioned a report that the Peloponnesians had caused poison to be thrown into the wells;" and he calls upon "every one, physician, or not, freely to declare his own sentiments about it, and to assign any *credible* account of its rise, &c."* Great stress, it is true, is not to be laid on an argument like this; it is sufficient, however, to counteract the absurd dogmatism of later writers, who have not hesitated to represent the disease as propagated from imported contagion.—Medicine, at this period, had scarcely disencumbered herself of her swaddling clothes; and though no person will venture to question the sagacity of the Athenians, and the peculiar talents of Thucydides for observation, neither his countrymen, nor himself, can fairly be supposed to have examined

* Smith's Thucydides, B. ii.

this subject with philosophical precision. The method least liable to rational objection will be, carefully to enumerate *all the circumstances connected with this memorable calamity.*—To this enumeration, therefore, we shall immediately attend.

1. The condition of the city of Athens, in its ordinary state, was favourable to the generation and continuance of febrile diseases, in their season.

2. The people of the town, as well as of the country, were accustomed to a vegetable diet, and to much and free exercise.

3. The population of Athens, in common, was small in proportion to its extent.

4. Its population, during the first years of the Peloponnesian war, was increased beyond all capacity of the place for accommodation.

5. The country people, especially, underwent a remarkable change of air, lodging, diet, and mode of life.

6. Exercise was, in great measure, denied to all; few were provided, in any considerable degree, with fresh provisions; all, probably, had salt meats; all were disheartened; most of them were without employment, and idle.

7. The plague first appeared in that part of the city where there was the least cleanliness; the least ventilation; the worst accommodations of all sorts; and where the people were the poorest of the country poor.

8. In this part of the town it broke out *all at once*, or "fell suddenly," to use the words of Thucydides; and thence, *gradually* extended to the better settled, and more healthy parts of the city. It was longest in reaching or appearing in the neighbouring country towns of Attica, which were, like Athens, in a state of siege or blockade.

9. It commenced in the sultry season of the year; after people had passed a year in this new and wretched situation, opprest in mind, and harrassed in body; and as soon as the summer sun came to operate on the collected filth of winter.

10. Those who came into the town, from the country, suffered most; and the poor more than the rich; and this in proportion as they were badly lodged and provided for.

11. Like other epidemical diseases, the plague of Athens converted every other complaint into itself, or banished it, during its own continuance.

12. It was fatal to domestic animals, as well as to men; and birds, and all wild animals, shunned the city during its prevalence.

13. It affected the Athenians only, when carried by their troops into other countries; and was never propagated into any other State than theirs—not even the contiguous towns of Peloponnesus

and Bœotia—notwithstanding the numerous encounters between the hostile nations.

In the summer of the year 430 A. C. when the plague first arose, the Athenians were fitting out a fleet, to commit depredations on the coast of Peloponnesus. This armament landed at Epidaurus, and expected to take the city; but the plague raged among the troops, destroyed numbers of them, and they were obliged to return without having effected their purpose. Plutarch* says that they communicated the disease to all who had intercourse with them. By this he may mean to all their allies.—The total silence of Thucydides, a cotemporary writer, on this point, would be a sufficient reason for believing this statement to be inaccurate, even if he had not, elsewhere,† expressly mentioned that the plague was never propagated to Peloponnesus.

The same summer, the Athenians sent a reinforcement to their army which was carrying on the siege of Potidea, a town of Chalcidica, lying on the gulf of Therma. The reinforcement amounted to 4000 men; and they found the troops before Potidea healthy. This did not long continue. They fell sick themselves; communicated the pestilence to the others; and returned, after a stay of forty days, having, in that time, lost 1050 of their number. Yet the old troops continued the siege, and afterwards took the place; and the Potideans were never affected by the disease.‡

14. The condition of the skin, mouth, &c. (hereafter to be more particularly noticed,) bore a striking resemblance to that state of the same parts which occurs in scurvy; a disease universally attributed to confinement, bad air, and want of fresh provisions.§

15. There was always a decline of the plague, when the harvest of the preceding year was spared; and the plague returned, when the harvest of the preceding year was destroyed.

The second great prevalence of the plague did not commence till after the middle of September; when the ordinary causes of fever are most accumulated; when the scanty supplies of the preceding year may be supposed to have been consumed; and when

* Article—Pericles.

† Smith's Thucydides, B. ii.

‡ Neither the Philadelphia fever of 1793, nor the New-York fever of 1795, were communicated to other places. The citizens of both places were, in numerous inſtances, ſeized with the fever, after leaving thoſe cities; but their country attendants eſcaped.—The Philadelphia fever appears to have been contagious—i. e. communicable by one to another, from contact, &c. The New-York fever, on the contrary, was rarely, or never, ſo communicated.

§ It is worthy an attentive inveſtigation, whether the peculiar ulcers, buboes, carbuncles, &c. of the plague, which render it worſe than our yellow fever, do not depend on ſalted meats, other defects in diet, and ſuch circumſtances, generally, as are known to occaſion ſcurvy.

those for the year succeeding, which should then have been gathered in, were cut off.*

16. The plague did not cease till after the incursions of the Peloponnesians were given over. But the consideration of the causes of its disappearance will be deferred for the conclusion of this section.

17. The Athenians, themselves, accused Pericles of having caused the plague, by bringing so vast a number of people into the city, who were ill-provided with lodgings, and lived in idleness, infecting the air, and poisoning one another.†

18. A further indication of the sentiments of the Athenians, concerning the source of their pestilence, may be perceived in the following fact. After the war, they constituted five distinct places, in separate Cantons, asylums for the country people, in times of invasion; nor have we any certain account of any future plague infesting their city.‡

A due consideration of the facts just enumerated can hardly fail to impress the mind of the reader with entire conviction of the domestic origin of the Athenian plague. Nor should we want medical authority to countenance us in the belief, if opinions could be admitted as confirmation. Yet, to pass by those of many living physicians of deserved reputation, who might be supposed improperly biassed in their decision on this question; and not to insist on the pointed declaration of the illustrious *Haller*, who considers the plague of Athens as an ordinary contagious fever, of local origin;§ it may not be impertinent to quote the words of the sagacious and learned De Pauw; whose opinion may be the more relied upon, as that elegant writer, not being a physician, was unlikely to be influenced by the prejudices so liberally ascribed to professional writers. After asserting the domestic origin of the plague, and noticing the sentiments of Haller on this point, he says, "To seek in Ethiopia the origin of a disorder, so evidently "arising from multitudes of men heaped and pressed together, "would be absurd; especially as its influence did not extend be-"yond the walls of Athens, and was totally unknown in every "other part of Greece. Similar effects would be now produced

* How far may HABIT be considered as influential in this case? The plague originally broke out in the first of summer; could the people have become so habituated to their situation as to require the accumulation of all the ordinary, as well as the extraordinary causes of fever, to the renewal of the disease?

† See Plutarch—Life of Pericles, near the end.

‡ London has never been afflicted by any extensive pestilence since the town was rebuilt, the streets widened, and sinks and water-closets provided. The low fevers of that city are mostly confined to the poor, and to such as reside in the old, narrow and dirty streets; which have derived little benefit from modern improvements.

§ Biblioth. Med. Prac.

" in any town where the particles of the atmosphere are entirely " changed, by being charged with different noxious effluvia, as " frequently happens in fleets, or among armies encamped in too " close order."*

Thus the sentiments of men not to be suspected of being any way warped by recent occurrences and discussions, are found to countenance the inferences ventured to be deduced, in this Essay, from an examination of facts relative to the Attic pestilence. But it is time to proceed to the consideration of the disease itself.

In the following account of the symptoms of the plague of Athens, the authority of Thucydides is principally relied on. He was a cotemporary writer, resided in Athens at the time, and was himself afflicted with the disorder. His relation is rather that of an historian than of a physician; for he purposely avoids noticing particular symptoms, though he gives us reason to believe that a great variety was observable in individual cases. Beside Thucydides, we have no original author on this epidemic. The *cases* left us by Hippocrates, if indeed written by him, must relate to some later plague, and in some other place. All the documents to establish the reality of his presence at Athens at the time we are treating of, are manifestly suppositious.† Nor is more credit due to the description of Lucretius;‡ though arrayed in all the transcendent charms of eloquence and poetry. He has done little more than versify Thucydides; interweaving with the words of the his-

* De Pauw, sect. ii. chap. 6.

† On this subject consult Mead's Works, p. 210. Edit. Edinb. 8vo. Athenian Letters, Letter 316. by Dr. Heberden, who, in a professed account of Hippocrates, is totally silent as to his fabled journey to Athens, and his equally fabulous exploits there, during this plague; but particularly " Histoire de la Medicine, &c. par Daniel Le Clerc," printed at Amsterdam, 1702, 4to. chap. xxxi. p. 232. where the authenticity of the papers referred to is examined at great length, and completely disproved. Indeed, the total silence of Thucydides in respect to Hippocrates' being at Athens, and his express declaration that " all human art was totally unavailing," seems sufficient proof that the papers called Τὰ ἐξωτικὰ by Foesius, in his edition of Hippocrates, are a fabrication by later hands.

The reader who may be curious to examine what Hippocrates has left concerning the plague, is referred to his treatise intituled τῶν ἐπιδημιῶν, or EPIDEMICS, Book iii. sect. 3. p. 166. Edit. Foes. he will there find a history of what Hippocrates considers a pestilential constitution, or condition of the atmosphere, generating plague; followed by some account of the symptoms, &c. of the disease, and a statement, more or less minute, of sixteen cases. These cases differ, in many striking particulars, as to the symptoms, duration, and event of the disease; of which the historian appears to have been no more than a looker-on. They are without date, either of place or year; and how useful soever they might be to a writer who should treat, generally, on the plague, deserve no consideration in relation to the subject of the present essay.

‡ DE RERUM NATURA, Lib. vi. p. 254. Edit. Barbou, (1754) ver. 19.

torian, some scattered passages from the Prognostics and Epidemics of Hippocrates, and superadding the wonderful embellishments of an ardent and vigorous imagination.

In the arrangement of symptoms, the order of Thucydides is not adhered to; both because, his account being historical, the method is not perfectly adapted to convey a connected exhibition of the disease, and because the variation now made will better enable the reader to compare the Athenian pestilence with those of Philadelphia in 1793, and New-York in 1795; the arrangement being nearly that of Dr. Rush, in his account of the former, and corresponding with the method pursued in the letters to Dr. Buel, on the latter.*

THE fore part of the year 430 A. C. was remarkably healthy; but whatever diseases existed at the time of the appearance of the Plague, were either banished by it, or assumed its livery. This disease broke forth suddenly. Its attack was, generally, sudden; commencing without any previous illness, or apparent cause. It began with violent head-ach, inflammation and fiery redness of the eyes; soon succeeded by inflammation of the throat, difficult respiration, and offensive breath. A sneezing and hoarseness followed, with cough and other pulmonary affections. But the progress and nature of the disorder will be more clearly comprehended, from the following disposition of the particular symptoms.

I. Thucydides has left us no observations to lead us to any minute information of the peculiar state of the *Blood-vessels*. Lucretius says there was hemorrhagy from the gums, fauces, and even the tongue; from all which a dark-coloured blood oozed.

II. Thucydides and Lucretius agree in describing the *breast* as severely affected. The former tells us that "the malady soon de-"scended to the breast, with a violent cough."†

All had hoarseness, extremely difficult respiration, and offensive breath. "A great part," says Thucydides, "of the infected were "subject to such violent *hiccups*, without any discharge, as brought "upon them a strong convulsion, to some of short, to others of a "very long continuance."‡

* See Mr. Webster's Collection, &c.

† Lucretius says the HEART was affected. But the word COR, in this place, is intended to signify the STOMACH; and in this he coincides with Thucydides. See annotations annexed to Creech's Version of Lucretius, note on line 1114.

‡ From the words "without any discharge," one might suppose that the common hiccup, noticed in fevers, is not all that was meant by Thucydides. I observed in the New-York fever of 1795, a mingled hiccuping and belching; and there sometimes occurs in dispeptic cases a kind of belching with violent spasmodic motions of the stomach, not readily distinguished, by the inexperienced

The *brain* was remarkably diseased, during the whole of the sickness. Violent head-ach, and inflamed eyes, were among the first symptoms by which the disease manifested itself. A morbid wakefulness "never abated for a moment," which cannot be attributed solely to the extreme restlessness of the sick.*

III. The whole *alimentary canal* was greatly deranged. The throat and tongue were inflamed;† and vomiting of bilious matter was general, "with excessive torture." When the sick out-lived the usual period of seven or nine days, the disease fell upon the bowels, which became "violently ulcerated;" and the ulcerations "were accompanied with an incessant flux, by which many, re-"duced to an excessive weakness, were carried off."

IV. The *Secretions* and *Excretions*, in the plague, were much increased; particularly from the intestinal canal. But, notwithstanding what Thucydides observes of "discharges of bile" in vomiting, there seems no more reason for supposing any remarkable secretion of that fluid, in this disease, than in our fevers; in which it is generally thought to be augmented: perhaps without sufficient reason. On the nature of the alvine discharges, Thucy-

observer, from hiccups. The hiccup is commonly accounted one of the most unfavourable symptoms, and does not often appear, in our fevers, till the close of the disease. But the hiccup of the Athenians seems to have been of early occurrence, and extreme violence; nor is it noted as particularly fatal; but of nearly universal experience. Convulsions are by no means peculiar to the Athenian plague. Violent cramp of the extremities, with pains of the bowels like those of COLICA PICTONUM, often occur in Yellow Fever; and I have, myself, observed a true, but irregular TRISMUS, in that complaint, not entirely disappearing for several days.

* When they passed over the first 7, 8, or 9 days, which may be considered as the first stage of the disorder, Lucretius informs us that it took another turn, and sometimes appeared in the form of a pain of the head, with a profuse discharge of corrupted blood from the nostrils. Of this, however, Thucydides says nothing. Were it admitted as fact, it would seem that, in these cases, the brain was principally affected; and would therein offer another resemblance to our fevers.

In a girl, who had the yellow fever, the summer of 1796, the greatest violence of the disease was expended on the brain; which continued much disordered for 12 or 14 days. The disappearance of the coma was attended by a dark discharge from her ears, one eye, and especially both nostrils. The discharge continued some days, gradually becoming light-coloured.

† The translator of Thucydides renders the words on which this remark is founded, viz. Καὶ τὰ ἐντὸς, ὅτι φάρυγξ, καὶ ἡ γλῶσσα ἰνθυς αἱματώδη ἦν. —"Within, the throat and tongue began instantly to be red as blood."—But the annotator on Creech's version of Lucretius translates the passage more correctly—"And inwardly their throats and tongues grew presently bloody." This difference is not material here; but it illustrates, confirms, and shews the origin of the remark of Lucretius, noticed under the first division in this arrangement of symptoms.

dides furnishes us with no remarks. The experience of most physicians will supply this defect, without recurring to the authority of Lucretius, who describes them as black, fœtid, and corrupt.—Nor may we place more confidence in his account of thin, salt, sparing, and saffron-coloured *sputa*, minutely copied from the Prognostics of Hippocrates.

The *sneezing*, noticed among the first symptoms of the disease, was probably accompanied with the usual increased discharge from the nostrils.

V. The hiccup, convulsions and morbid wakefulness, already mentioned, indicate the diseased condition of the *Nervous System*.

Thucydides enlarges, with consummate eloquence, on the terrible influence which this calamity exercised over the minds of his countrymen. As no treatment afforded any certain relief, and as the disease spared neither age nor sex, few dared to yield assistance to their friends; and when some generous spirits flew to the relief of others, it was in a fit of despair, with the expectation, or determination, of sharing their fate.—A dubious and destructive war agitated the minds of all. Pent up within their walls, destitute of employment, they saw their friends perishing around them, and a merciless enemy laying waste their territory, and threatening them with famine.—The melancholy emigrants from the country beheld their possessions desolated, their houses devoted to the flames, and themselves menaced with utter extirpation; while neither the consolations of affection, the prospect of speedy succour, nor the comforts of food and cloathing, of lodging and attendance, were extended to their relief.—A superstitious horror seized on every heart, and weighed down every spirit, when they remembered the interdictions of the Oracle. They shuddered when they saw the pestilence depopulate the *Pelasgic*, on which they had impiously erected their miserable dwellings; and imagined, in the dreadful calamity that oppressed and overwhelmed them, the effects of the vengeance of the offended Gods. But, "whatever supplications were offered in the temples, whatever "recourse to oracles and religious rites, all were unavailing." At length, with the hope of favourable change, regard to decency was lost. An utter depravity of morals extended itself with the disorder; aided it, in all its ravages; and exceeded it, in the measure of its desolation.

In the sick, "dejection of mind constantly attended, from the "first attack;" and after some continuance of the disease, and when its operation was well understood, those who were seized with it instantly relinquished every hope, and surrendered themselves to an expected death in silence and despair.

Such were the affections of the mind, during the continuance of the disease, in the sick and well.—A frequent consequence was a loss of Memory; and oftentimes an incurable Fatuity. "Some," says Thucydides, "who quite recovered, had at once totally lost "all memory, and quite forgot not only their most intimate friends, "but even their own selves." And this serves to confirm our opinion that the Brain suffered great derangement in the plague.

VI. It is probable, from the affections of the head and eyes, and even asserted by Lucretius, that the *vision* was impaired. Some recovered with a total loss of the substance of the eyes.

The condition of the nostrils and fauces, doubtless, impaired or destroyed, for the time, both *smell* and *taste*.

The *appetite for food* is no farther noticed by the historian, than to inform us that no kind of diet seemed to have any curative effect.

The patient's *sense of heat* and *thirst* were intolerable; and so painful as nearly to occasion madness. Though the skin did not seem hot to the touch of the by-standers, yet in the patient it appeared to inflame his whole body. The heat was so excessive that the sick could not bear the slightest covering, or finest linen; but lay naked, in the streets, and even in the wells and cisterns, if they could get into them: hurried away no less by this dreadful heat, than by a thirst at once insufferable and insatiable. "For, "whether they drank much or little, their torment still continued "the same."

VII. The ulcerations and discharges from the bowels before mentioned, seem connected with some derangement of the *lymphatic system*.

When the patient outlived the first stage, and the disease did not expend its force on the intestinal canal, there seems to have been an absorption of the pestilential fluids, perhaps from the bowels, which were carried into the circulation, and deposited on particular members. In this case, it affected the fingers, toes, and genital organs; and many recovered from the plague with the loss of these parts. Lucretius intimates, that their lives were sometimes preserved by amputation of the organs diseased. "*Vivebant ferro privati parte virili.*"

VIII. The *skin* was not hot to the touch; neither was it cold, nor pallid—"but reddish, livid, marked all over with little pustules "and sores."*

* Lucretius compares the appearance of the skin to that occasioned by ERYSIPELAS; and says, that no excessive heat was to be discovered even "IN SUMMO ARDORE:" by which I conjecture him to mean in the exacerbations of the fever.

IX. The plague of Athens appears to have been an acute and continued fever; terminating fatally on the seventh or ninth days, for the most part; but if longer continued, falling on the intestines, in the form of dysentery; or affecting the extremities and genital organs.

When the disease lasted only seven or nine days, there was very little visible waste of the body, and "the strength was not exhausted."* When protracted, in the shape of dysentery, it commonly proved fatal; exhausting the patient, and reducing him to the extreme of weakness and wasting. When the disease fell upon the extremities, &c. (and, according to Lucretius, when a discharge of dark-coloured and fœtid matter happened from the nostrils,) it seems that the sick commonly recovered.

But, though the fever was usually continued, this was not uniformly the fact. Sometimes it was lingering, and had intermissions. This was its appearance in the case of Pericles; whose body had, probably, been prepared by degrees; and previously worn down by fatigue and grief. He was one of the first victims to the second increase and violence of the plague; having escaped it for three years and a half; and it is probable that the calumnies of his enemies, the ill success of some of his enterprizes, the ingratitude of one of his sons, and the death of the one most worthy of his love, and of whom he was doatingly fond, predisposed him to be affected.†

X. The old and young, males and females, the robust and feeble, were equally exposed to the disease, and equally destroyed by it.

No medicine appeared to have any effect in relieving the pains, or in hastening or promoting recovery.

No person had the disorder twice; or rather none were re-infected.

Those who removed from the country suffered most; not merely because they were worse accommodated than the town's-people, but from so total a change in all their habits.—The historian brings their sufferings before our eyes in a masterly manner.—"As they "had no houses, but dwelled all the summer season in booths, "where there was scarce room to breathe, the pestilence destroyed "with the utmost disorder, so that they lay together in heaps, the

* I have uniformly observed in the yellow fever, that few recover who are able to walk about as late as the 5th or 6th day of the disease; when no previous medical assistance has been afforded them. Indeed it may be confidently affirmed that, where such vigour remains in the muscles, it is not the vigour of health, and the vital parts are proportionally diseased. This unnatural appearance of strength is like that produced by intoxicating liquors: the poison of contagion is meanwhile busily undermining life.

† See Plutarch—Life of Pericles.

"dying upon the dead, and the dead upon the dying. Some were "tumbling one over another, in the public streets, or lay expiring "round about every fountain, whither they had crept to assuage "their immoderate thirst. The temples, in which they had erected "tents for their reception, were full of the bodies of those who "had expired there."*

It is perhaps impossible to make any estimate which may be depended on, of the number of persons who died of the Athenian pestilence. The disease continued four years and a half from its commencement; during three years of which time, the mortality was constant. For eighteen months it abated, but was not extinct. Thucydides, when he mentions the disease the last time, gives an imperfect account of the number of deaths. Whether this account is meant to include the whole, or only those who died in the last year of the plague, is uncertain. Probably the whole is meant of those who died at Athens; but it is still doubtful whether he computes the loss sustained by the troops engaged in foreign service. In this dilemma we can do no better than to quote the words of the historian himself, in the language of his translator:— "It appeared, from the muster-rolls, that there perished 4400 of "those citizens who wore heavy armour, and 300 of the horse-"men. The number of the lower people who died was not to "be computed."

It remains for us to assign some probable reasons for the cessation and disappearance of the pestilence whose history we have been considering. These will be found in the following circumstances, which preceded and accompanied its departure.

1. The whole people of Attica, with the exception of such as were employed in the armies and in the garrisoned towns, had been included within the walls of Athens for near six years. Though habitually addicted to a country life and vegetable diet, from which they had been mostly restricted, they must, in so long a period, have gained, in some measure, new habits, become reconciled to their mode of life, and gradually hardened against the operation of contagion.

2. Numbers had recovered from the disease; and as none were twice affected, they enjoyed an immunity from its attacks.

3. Several thousands of their countrymen had fallen in battle; many were captive, in other countries; they had garrisons in seve-

* Compare the situation of these people with that of the Irish emigrants to New-York, in 1795. See the Rev. Mr. O'Brien's letter to Mr. Bailey, in his account of the fever of 1795, page 89.—Of more than 700 persons who died in New-York, in 1795, only 150 were citizens. See Webster's Collection, last page.

ral of the foreign states; armies in others; and a prodigious fleet, full of mariners and soldiers, triumphant over the sea. This diminished the number of inhabitants in Athens; and allowed more room, and a greater quantity of suitable food, to those who remained.

4. Many thousands fell victims to the plague; and the deaths were chiefly among those who were most crowded together. Opportunity was thus given for those who survived to acquire better lodgings, and better accommodations of every kind.—It is probable that the deaths by war and disease, and the space vacated by the armaments abroad, diminished the population at least a third.

5. The same season that the plague broke out a second time, Athens, Eubœa, and all the neighbouring country, felt the shocks of successive earthquakes. The next spring, new earthquakes happened, so as to deter the Peloponnesians from entering Attica. The sea broke over the land in Eubœa, and on the continent, a little above Athens.—This was the last year of the plague. The next season (year 425) was very tempestuous; and though the Peloponnesians entered Attica, yet they came so early as to do very little damage, and were obliged to retire after a stay of only fifteen days. They never repeated their incursions; and the next year another earthquake was felt. Is it not probable that such a succession of tempestuous seasons, materially affected and altered the atmosphere of Attica and Athens?

6. But, perhaps, the most material advantage derived from these stormy seasons was, that they put an end to the blockade of Athens, and to the war on the land-side. Thus the people were, once more, allowed to issue from the city; to re-visit the deserted country; re-erect their rural habitations; extend the cheering and beautifying hand of cultivation to the desolated and afflicted fields; to crown their heads with chaplets, and their boards with fruits. —The last ravages of any extent, committed by the Peloponnesians, were in 427; they were deterred from renewing them in 426; and the pestilence ceased with that year.

THE history of the *Plague of Athens*, now concluded, offers so many points of resemblance, both in its nature and origin, to our own fevers, that we may be justified in declaring it to have been, in all essential particulars, the same disease. A minute comparison, should it display minute dissimilarities, could scarcely

fail of presenting as many minute similarities; and a due consideration of every circumstance cannot but impress the mind with a deep conviction of the unity of cause, in ages so remote. This point, so well established, ought to make us careful how we overlook the more obvious sources of pestilential diseases, in our search after those which are foreign and remote. If local causes originated a pestilence in Athens, local causes may generate a Yellow Fever in Philadelphia and New-York. To these, then, be our attention more scrupulously directed; and let us be more solicitous in the inspection of our houses, yards, streets and docks, than of cottons and woollens, of vessels from the West-Indies, and ships from the Mediterranean.

ARTICLE II.

REMARKS ON MANURES:

Wherein, by an Inquiry into the Nature of Septon, (Azote) *and its Relations to other Bodies, it will be seen how nearly* Physic *and* Farming *are allied to each other. Intended as a Sequel to Judge* PETERS's *Agricultural Inquiries on Plaister of Paris. By* SAMUEL L. MITCHILL, *Member of the Legislative Assembly of the State of New-York, Fellow of the Royal Society of Edinburgh, Professor of Che.. istry, &c. in Columbia College, &c. &c.*

IT will appear from a perusal of a great number of books, that an opinion, grounded on fact and long observation, has, from early ages, prevailed among writers, that there was something of an *acid* nature produced in the atmosphere. The names they gave to this acid shew, that the principal and most respectable notices about it, were tinctured with much conjecture and uncertainty. Sometimes it was called *acidum primogenium*, because it was imagined to be the first-formed acid, and that other acids derived their qualities in some measure from it; then it was called *acidum universale*, on account of its existence so generally where the business of men was carried on; again, it was termed *acidum vagum*, as it seemed to stray and wander about through air and water, attaching itself now to one thing, and then to another. It was by some denominated *acidum atmosphericum*, from its presence and universality in the atmosphere; and by others, *acidum aëreum*, by reason of the gaseous or volatile form it assumed while flying about, or floating along with the winds. And when artificially prepared, by disuniting it from pot-ash, with which it loved dearly to associate, it has since received the more specific and determinate names of the *nitrous and nitric acid*. The learned examiner will pretty readily discern, that the fact intended to be expressed by these various terms had, from an early period of history, attracted the attention of mankind; and that, in expressing their sentiments about it, while all agreed it was an acid, different names were given to it, according to the guess and fancy of each observer. And it may also be collected, that under the enumerated terms, were contained not only the effects truly ascribable to the vaporific or nitrous acid, but, through want of discriminating an analogy then not understood between it and certain other acids, the names employed, embraced likewise a number of phenomena, which more recent science has traced to the operation of *oxygenous air*, and

carbonic acid air. It appears to have been a favourite notion of some acute investigators, that there was not only a generally-prevailing principle of acidity, but that acids formed by it, were, to a certain extent, at least, convertible into each other. Experiments, indeed, upon the acids afforded by vegetables, countenance the idea of the radical similarity, or perhaps sameness of the acid of tartar, vinegar, sugar and must. (CRELL. Chemische Annalen, &c. Chemical Essays of C. W. SCHEELE, Ess. xxiii.) But it was surely carrying the business too far, to affirm, with INGENHOUSZ, (2 Experiences sur les Vegetaux, § xvii. p. 110.) so late as the year 1789, in asseveration of an idea often maintained by others before him, that the aerial acid (by which he meant carbonic acid, or fixed air) may be a wandering "acid, (acide vague) convertible into "every other acid," and "all other acids convertible into fixed "air; and that these considerations might give us new light con-"cerning the regeneration of the *nitrous acid* in earth, from which "it had been wholly extracted."

The whole of modern experience on those subjects goes to the establishment of these points, that vital or oxygenous air is composed of heat, oxygene, and light; fixed air, or carbonic acid, of heat, oxygene, and charcoal; nitrous acid, of heat, oxygene, and septon; and phlogisticated air or atmospherieal mephitis, of heat and septon. Nitrous acid may therefore be resolved into two distinct airs; to wit, *oxygenous air*, when the principle of acidity quits its septous basis, and flies off with heat; and *atmospherical mephitis*, when the septon deserted by the substance from which it derived its sourness, turns to a gas with the matter of heat also; and, on the other hand, it is equally clear, that the two airs, which in their distinct state, (JACQUIN, Commentar. de rebus, &c.) constitute the atmosphere, may unite their basis chemically to each other, part with a portion of their caloric, and form the nitric or atmospheric acid. The idea of the convertibility of fixed air and nitrous acid into each other, as they are radically and totally distinct, is conjecture without any probability whatever to support it; though I see no improbability in the association of septon and carbone, in such a manner as to form with oxygene, an oxyd or acid with a double base, which I suppose to be one of the modifications of those animal poisons called *specific contagions*.

As the words poisons and contagions have been mentioned, I shall observe, that septon and oxygene most probably enter into the composition of the whole of them. From chemical combinations of these, acting upon different parts of the body, seem to spring the common symptoms of fevers, dysenteries and plagues. And thus, a clear idea can be entertained of the nature and composition of *common infection*. But, as there are some distempers of a nature that have been called *specifically* contagious, their constitu-

tion may be conceived, by supposing the matter of small-pox, for instance, to derive its peculiar quality from a commixture of carbone, with the matter of ordinary contagion; that of syphylis, to arise from phosphorus, blended with the septon and oxygene; that of measles, from a combination of sulphur; that of pertussis, or croup, from the addition of the unknown radical of the muriatic acid, forming a nitro-muriatic oxyd or acid vapour, &c. and, in like manner, may conjectures be found about the poisonous matter of rabid and other animals.

I suggest these things in this place because there is reason to consider all these compositions of atmospherical and animal matter, as good manures.

If any reliance is to be placed on INGENHOUSZ's experiments, we must admit that a great number of growing and healthy vegetables during the prevalence of darkness, emit from their leaves septous (azotic) air (2 Experiences sur, &c. sect. vii. and ubiq.) A fresh cabbage leaf exposed to air for a night, is said to have mephitized it. But whether these are true relations or not, it is admitted by all parties, that *some* plants, when they ferment or rot, afford azotic air. The question now to be examined is whence the vegetables that exhale azotic air when alive or emit it when dead, originally derived the azote (septon) or basis of that air?

If can be shewn that there are manures that contain septon, that this frequently evaporates with heat in the form of septous (azotic) air or combines with oxygene into septic (nitric) acid, or rises to a small height in the form of nitric (septic) acid gas, then it will be evident what the sources are whence vegetables may derive it.

Now the belief of mankind from a very early period of ancient history has favoured the existence of a primitive and universal acid, existing at almost all times and places, and performing great things in the economy of this world. The experiments of the moderns have established the truth of this opinion, by ascertaining that, by a law of nature, the septon of those plants and animals which contain it, does, during the putrefactive decay of such organized substances, very commonly unite with oxygene, and form the acid of putrefaction, or the nitric acid. And as all living systems, whether of plants or animals, must die and undergo dissolution, such a mass of putrifying materials, corrupting at all times and in all places, will generate enough of septic (nitric) acid to countenance the ancient idea of the universality of its existence. It is, therefore, the most abundant and most active of all acids, at least as respects man and the various objects with which he is conversant, on or near the surface of the earth.

Among other effects which oxyds and acids of this sort seem to produce, when volatilized by heat, they float about in the atmos-

phere, *endemic* and *epidemic* distempers deserve to be particularly mentioned. Accordingly, sickness of one or other of these denominations has been always remarked to prevail where putrefaction and corruption abounded, where septic vapours contaminated the atmosphere, and where the bodies of living animals inhaled them in sufficient quantity. Hence, it has been remarked, that in countries or places where the atmosphere possesses vital air enough to support the life of animals, and is not infected with such a quantity of septic and pestilential vapours as to induce sickness, and shorten the lives of the inhabitants, that vegetables thrive well. This state of moderate purity, appearing to be best adapted to the convenience of both plants and animals. But in situations where a soil, over-rich with moist and putrid materials, exhales its septic and unwholesome steams, and excites agues, fevers and plagues, there it often happens that vegetation goes on vigorously, and in proportion to its luxuriance, lessens, by converting to its own use, the quantity of pestilential matter in the soil and air. While on sandy, mountainous, and rocky places, where only small quantities of putrid substances can collect, where the atmosphere is little or not at all poisoned with their exhalations, but the respirable portion of it is unusually large, in such circumstances plants thrive but poorly.

These general remarks, which I take to be facts, have not, that I recollect, been well explained: physicians, by confining themselves too strictly to the narrow views and pursuits of a profession, have seldom written the history of endemic and epidemic diseases as they ought to be written. They should have dwelt much more at large than has been generally done on concomitant and surrounding events, as well as the detailed enumeration of symptoms, and prescriptions. In discussing these subjects, the persons who made it a profession to study the constitution of man, have thought it beneath their dignity to seek information from their brother physicians, who superintend the health of such mean objects as brute animals, and plants. But it is vain and idle to separate, in speculation, events which the unchanging order of things has connected indissolubly together. Amidst the darkness which overhangs this subject, physic will find it impossible to read a page of the book of nature, unless agriculture lights and trims the lamp.

Supposing, then, that septic acid vapours contaminate the atmosphere, and destroy men and other animals, these must undergo decomposition after death, and enlarge the mass of putrefying materials. Every carcase added to the heap, increases, with regard to plants, the quantity of aliment, and, with respect to mankind, augments the bulk of poison.—An inquiry into the particular phenomena which a country sickly by reason of its fertility, or a dung-heap unwholesome on account of its richness, presents to

the mind, will go a great way toward elucidating the history of azote, or the principle of putrefaction in manures.

There septon (azote) exists in one or other of these forms:

1. Pure or uncombined septon.
2. Septon converted to an elastic fluid by caloric, and existing in the form of azotic gas.
3. Septon, combined with a small portion of the principle of acidity, but not oxygenated highly enough to become acid, turned to a gas by heat, and existing in the form of dephlogisticated nitrous air.
4. Septon united to a large portion of oxygene, and exhibiting itself in the form of nitrous gas.
5. Septon charged with yet a larger dose of the principle of acidity, and assuming the form of aqua-fortis, or smoking nitrous acid.
6. Septon still more highly oxygenated, and becoming the septic, nitric, or dephlogisticated nitrous acid.
7. Septon combined with a yet greater proportion of oxygene, and converted by heat into a gazeous form, and thus becoming the septic or nitric acid air or vapour.
8. Septic acid in weak commixture with water, as in certain dews and fogs, and in showers attended with sharp lightning.
9. Septic acid acting upon timber, horns, bones, leather, shavings, straw, rags, and other substances, strewed over fertile soils, or entering into the composition of manure.
10. Septic acid joined to pot-ash, and forming the nitre or saltpetre of soils.
11. Septic acid united with soda, and making quadrangular or cubic nitre.
12. Septic acid associated with lime or calcarious earth, and constituting calcarious nitre.
13. Septic acid acting upon volatile alkali, and affording nitrous ammoniac.
14. Septic acid in conjunction with clay, and, by their union, giving rise to alumen nitrosum.
15. Septic acid combined with oil, and turning it black, by virtue of its own partial decomposition, as in foul soap suds, &c.

In this enumeration are included the principal compositions of septon with other bodies which relate to agriculture. A few remarks on each of them will illustrate the respective value of each, and its relation to other things. On the first five there will not be a necessity of offering much. For,

1. Whether we consider the ultimate particles of matter as solid and indivisible atoms, or as mere mathematical points, endowed with attractive and repulsive powers, such is their extreme minute-

ness or tenuity, that they evade all examination. Septon is one of those subtle and fugitive things which has never yet been obtained distinct from all other substances, and examined by itself. There is, however, no reason on that account to doubt its existence, because it enters largely into the constitution of the blood muscles, and lean parts of animals; and on its union,

2. With caloric, or the matter of heat, it takes upon itself an aërial form, and constitutes that sort of gas which some experimenters suppose living and healthy plants emit, during the absence of sun-shine; the same species of air of which the greater part of the atmosphere consists, and by which growing vegetables are incessantly surrounded. If what are called their tracheæ, or air-vessels, take in air at all, doubtless a portion of this particular kind is absorbed.

3. If the septous or azotic air, just mentioned, has dissolved a very small portion of oxygene, so as to oxydate, but not acidify it, a very singular sort of gazeous compound is formed, whose operation, in agriculture, has never yet been properly investigated.

4 and 5. Septic gas and septous acid are never found to exist for any considerable length of time, in the open air; but of all the compounds formed by septon with oxygene, these two are the most frequent in laboratories, and are the subjects of the chief experiments in science and the arts. They are artificial productions, and must be kept in closely-stopped vessels. Their existence, during exposure to the common atmosphere, is only momentary; for they both absorb oxygene so greedily as very soon to turn to pale and colourless septic (nitric) acid, which is the ordinary and most natural form they assume. As the qualities of nitrous air and aqua-fortis are very different from those possessed by the more highly oxygenated acid, the experiments upon the two former, and the reasonings upon them, are not to be applied to account for the phenomena of the latter. A practice too frequently done, to the bane and detriment of science! As they can only exist when closely stopped, so they can have no influence on manures and soils, nor on the constitution of plants and animals. And whenever they can find oxygene they attract enough of it to turn to septic acid.

6 and 7. The nitric acid, and oxygenated nitric acid vapour, are the forms in which septic compounds most commonly and universally exist. In these states, pale, colourless, and possessing in their sparse and dilute condition, few obviously-striking or sensible qualities, mankind observed enough of them to be prompted to make vague conjectures about something acid, but knew too little to form any correct opinion on the subject. The former may be produced whenever septon and oxygene come into chemical union. By the effect of lightning in the clouds the basis

of the two gases, constituting our atmosphere, seem to be made to unite, and thus produce the septic acid, with which the rain-water of thunder-showers is tinctured. During the putrefactive process of much animal matter which abounds with septon, the oxygene of the corrupting bodies themselves, or of the water in or near them, or of the circumambient air, joins with that basis, and forms the acid of putrefaction. And while corruption of such vegetable bodies as contain septon, is going on, an acid with the same radical is produced. Yet we constantly find in the books, this acid classed with *fossil* bodies. Even in a book printed as late as the year 1791, from a compilation of so well informed a man as the ABBE ROZIER, (1 Cours complet d'Agriculture, tit. Acide, p. 231.) no mention is made of this, as of animal extraction, but it remains preposterously ranked with *mineral acids*. This notion is the cause of much misconception and error in estimating its qualities and operation. It is wholly immaterial from what body the septon and oxygene are derived; whether they are furnished by the animal, vegetable, or aërial departments of nature, they may enter into chemical union by putrefactive and electrical aid, and constitute the atmospheric or primogenial acid. The septous and oxygenous gases of the atmosphere are, in ordinary circumstances, perfectly disunited; but when their bases are associated by chemical attraction, they form the new product now under consideration. These same radicals, constituting a part of vegetables and animals, do very commonly get within the sphere of each other's attraction, during the disorganization of such bodies, and form a similar composition. Hence the universality of such a production can be readily comprehended, and a reason be given for the greater prevalence of it, in and around the bodies and habitations of men, especially the carnivorous and unclean:—and wherefore, as all living beings must die and be disorganized, the quantity of septon united to oxygene, during such processes, must be prodigious, and surpassing all estimation.—Where large quantities of this compound are produced, and the ground, after the evaporation of its moisture, becomes hot and dry, the septic acid will be converted to a gas, and in the form of vapour, pervade the atmosphere near the earth's surface. As its qualities, when acting upon many animal bodies, are caustic, corrosive, inflammatory, and suffocating, it very commonly incommodes or destroys such of them as live near its source or manufactory; exciting, by its venomous properties, agues, fevers, anguish, catarrhs, diarrhœas, dysenteries, eruptions, plagues, &c. according to the degree of concentration, to the quantity applied, the length of time for which its action is continued, the susceptibility of the constitution it fixes upon, the part of the system now particularly invaded, &c. &c.—From this history of the genera-

tion and growth of these pestilential fluids, it would seem that, in process of time, the salubrity of the atmosphere would be destroyed, and the oxygenous and septous gases forming it, lose their distinct forms, and coalesce into nitric acid and its vapour. As far as I can judge this would really happen, was it not that there are various ways whereby this acid is neutralized and decompounded. Some of these we know, and others there probably are, though as yet unknown to us. As the septic acid and its vapours never constitute the nourishment of plants, but in conjunction with other substances, it will be proper to dwell a little upon these. The examination of these facts will explain by what economy of nature this acid is neutralized, and its noxious and pestilential vapours repressed. And, at the same time, it will give a tolerable idea of the manner in which the compounds formed by it, with different saline and earthy bodies, contribute to the fertilization of soil, and the thriftiness of vegetation. In doing this I shall endeavour to follow the method of nature.

8. From the analysis of rain-water, by BERGMAN, and other able Chemists, it is found to contain a small portion of this acid; and it is probably more owing to this than to the presence of fixed air, that this kind of water, especially during showers, accompanied with lightning, becomes turbid by mixture with lime-water, as SENNEBIER observes, while common rain-water exhibited no such appearance. In these cases the septic acid formed by the electric flashes in the clouds, seems to unite with the lime into calcarious nitre. The use of this acid in vegetation is proved by the experiments of HOME, who found a diluted mixture of nitrous acid in water to be a good manure for certain gramineous plants. This acidulous tincture of rain-water then, may be considered as a bountiful provision of nature, to supply the gramina, which afford pasture and forage as well as those which yield bread-corn with a nutritive material, in every shower which besprinkles the face of the earth during summer. This view of the subject too, indicates one of the great and beneficial uses of electric explosions in the atmosphere. But while this diluted acid refreshes and feeds the vegetable world, it has often been remarked to operate unhealthily upon human constitutions; many men being subjected to febrile indispositions, after exposure and soaking in such falls of rain.

Facts from all quarters prove, that the septic acid generated by putrefaction, is always on the earth's surface, and its vapours never rise to a great height above it. From these exhalations, the water of dews, mists and fogs, precipitated when the atmosphere is cooled, particularly during the night, receives a portion of the same acid, which thus united, attach themselves to animal and vegetable bodies. Exposure to water so impregnated, causes the most violent distempers in the southern latitudes, and is followed by almost

certain destruction of human life in many places. The dew, bringing down with it as it falls, pestilential matter enough to poison the constitutions of men in a single night; nor, in these cases, do the bodies of men only suffer. I am strongly led to believe, that too great a quantity of this material, or too frequent a repetition of it, even in our own climate, is a common cause of blasts, blights, and mildews in our harvests. Too much of this matter deposited upon plants, stimulates them excessively, and makes them sickly. And the diseased spots so often observed, when drops of dew have long remained upon the leaves and fruit of trees after the watery parts have been evaporated, seems to evince the operation of some venomous and caustic substance left behind to work such injurious effects. It is well known, that some of the mildews are accompanied with multitudes of microscopical plants growing upon the blighted spots, and these parasitical productions have been thought to be the cause of the malady of the plants on which they grew. The more just opinion is, that the mildewed plants, the wheat, for instance, first grew sickly, by the corroding and scorching effect of too much septic acid precipitated with the dew; and after certain spots were discoloured and mortified by its action, the growth of little funguses spouted forth from the distempered part, and are an effect, not a cause of the mischief. They, therefore, injure the plant on which they grow, not by converting its juices to their own nourishment, but their presence serves as an index to shew the mildewed vegetable was injured before. The quantity of this manure, which falls in common rain and dew, seems very nicely proportioned to what the economy of vegetables can receive with advantage, and that of animals can bear with no considerable detriment; while the proportion of it descending with dews in certain highly contaminated conditions of the atmosphere near the earth, may not only disturb the health of animals, but, by their excessive strength and stimulation, work destructive effects upon vegetables themselves. The proneness of metallic substances to rust, and the restoration of their former qualities, to exhausted nitre grounds, by the influence of such dews, give countenance to this mode of reasoning on the facts. Thus it appears, that certain plants, among which may be reckoned, perhaps, all the gramina, tetradynamia, and *fungi* of the botanists, and all such as by their analysis are found to contain septon, derive it from the septic acid, which, in its very weak state, they seem capable of inhaling without detriment. This acid is very easily decomposed. Its basis, the *septon*, is retained in such a proportion, as the economy of the plant requires; on the decomposition of the acid within the plant, the surplusage is discharged in the form of *mephitic* or *azotic air*; while its *oxygene*, after having supplied as much of that ingredient as is needed, sends off its overplus, to make a junction with *light*, and constitute *vital*

air. The doctrine now stated, as connected with rain and dew, is equally applicable to the septic acid formed in dung-heaps, stables, duck-puddles, muck-holes, &c. where a moderate quantity of it acts as a fertilizer, but too much induces sterility, by burning up all before it. A recollection of the facts relative to over-manuring with such substances will evince the high probability of this reasoning, and lead to a true theory of ashes and lime, as manures and neutralizers. And do not pond-water, brook-water, and swamp-water, owe a part of their enriching quality to the presence of the same septic compound, produced from the animal and vegetable matter decaying within them? Do I go too far in ascribing, in part, to vegetables, the correction of that taint, which, if not kept within due limits, might give, at last, to all the waters of the globe, as venomous qualities as those of ponds and marshes have been long found to possess? Am I wrong in believing, that, on the exhalation of the water, the septic effluvium rises into the air, and makes the neighbouring inhabitants sick; because, in such cases, the vegetable economy cannot decompound it, and there is no sufficient neutralizer on the denuded surface of mud, to keep it from rising?

Be these things as they may, there is evidently a connection, within certain bounds, between the fertilizing quality of water upon plants, and its moderately hurtful operation upon animals; and beyond those limits, both classes of beings become distempered and die, by its action. The septic acid appears to be the material, which, according to its quality, strength, mixture with water, and extrication from it, &c. produces these, amidst a variety of other effects.

9. Among other memorable changes wrought by the septic acid in mixture with water, those it works upon the putrifying materials of the heap wherein it is produced are by no means the least considerable. This acid is one of those substances which the makers of experiments have been pleased to call *antiseptic*, from its power, in some instances, of resisting common putrefaction. From the overcoming of this acid in manures, by lime and alkalies, it has probably happened, that these latter substances have been termed septics, or promoters of putrefaction. This is a deceitful statement, for alkalis resist corruption as powerfully as acids do, and, if possible, in a higher degree. This notion of the septic quality, and tendency of calcarious earth, has led to a world of mistake and misconception concerning lime as a manure. Lime, it was said, by the septicity of its nature, disposed manure to rot. This assertion, made, I believe, first by Sir JOHN PRINGLE, and repeated by almost every writer since, appears to have no foundation in truth. PRINGLE's Doctrine of *Septics* and *Antiseptics*, is full of false philosophy, and has done abundance of harm. It is the source

whence most of the erroneous ideas current now a-days, about those classes of objects, are derived. The operation of lime, when thrown among common manure, is to combine with the strongest acid the heap contains. This is usually the septic or acid of putrefaction, which, if quick-lime be added, neutralizes it without effervescence; if mild lime be thrown on, combines with it, after expelling the carbonic acid or fixed air. The product in both cases is calcarious nitre, whose qualities I shall examine further by and by. If lime and alkalies are considerable promoters of putrefaction, it must arise, saving their transient effect when in their caustive state, from their taking to themselves and saturating so strong an antiseptic as the nitric acid of the manure. But this conclusion also is fallacious; for the nitric acid, antiseptic as it is, is known to be a great corroder or disorganizer and destroyer of a great variety of things. There is formed from the softer and more perishable parts of organized bodies, an acid liquor, possessed of qualities capable of breaking down or eating away the texture of the most compact and durable. Thus, both in the grave and the dunghill, by the operation of the acid of putrefaction, the firmness of bones is dissolved, as it expels the acid of phosphorus, and associates itself with their calcarious basis, in the form of a calcarious nitre (nitrite of lime): Thus the tougher compages of horns is by slower degrees made to yield to the same powerful menstruum; in like manner the skinny parts of animals, whether crude or tanned, lose their cohesion by the destroying effect of this offspring of corruption; by the same means, the solid coherence of wood and timber is forced to crumble down and waste away, at a rapid rate, in all places where water and putrid vapours, near the surface of the ground, can act with full effect upon them; the accelerated corruption of shavings, straw, and rags of linen, cotton and wool, added to animal manure, leaves little or no doubt that their more rapid disorganization in such cases proceeds from the nitric (septic) acid by which they are penetrated. Such seems to be the operation of septic acid, as it co-operates with other causes, in breaking down the nicely-wrought and finely-fabricated works of animated machinery. And every other thing would be obliged to yield to its rapacity and violence, had it not been so provided, that this arch destroyer should become glutted and saturated with conquest, and unable to pursue the work of destruction any longer.

10. After this triumph over every thing delicate or beautiful exhibited in the composition of the solid and more durable parts of organized matter, the acid rises from its mass of ruin, for lack of farther employ, and proceeds through the air to the neighbouring places. In this state it often meets with the bodies of men, and attempts to carry on, in all it meets, the accustomed

process of destruction. Hence arise distempers of different malignity, in proportion to circumstances favourable, or, otherwise, to the operation of the poison imbibed. Hence the unhealthiness so often complained of and commented upon, of the steams issued from large collections of rich manure. But active and volatile as they are, there are substances which have power to coerce and restrain them; to disarm them of their ferocity, and make them calm and gentle. The chief of these is pot-ash, or the vegetable fixed alkali, that saline substance which is afford by the incineration of plants; that which in the shops is called salt of wormwood and salt of tartar. The union of the septic acid with this alkali, forms the septite of pot-ash, the very salt commonly known by the name of nitre and salt-petre, and from which this acid has almost always, to the great injury of science, borrowed the name of nitrous. It is not essential to the present inquiry to determine the controverted question, whether pot-ash is a simple and elementary substance, or whether it is a compound body, formed in the fire during the combustion of wood. Of all bodies existing where putrefaction goes on, this salt has the strongest attraction for the acid of putrefaction. Consequently the acid will quit its connection with all other substances, and attach itself to this alkali. The extent to which this takes place will determine the quantity of salt-petre produced, and the quantity of septic acid neutralized by it, and taken out of circulation. Pot-ash then acts in a beneficial and wholesome manner, by repressing and keeping down that fluid which, by rising in vapour, might occasion intermittent fevers, or, according to its degree of malignity, others of a more alarming nature, and even pestilence itself. It will be found accordingly, that the region of unhealthy exhalations of this kind, is that where the substances on the earth neutralize this destructive acid either partially or not at all. As far as pot-ash is concerned in this process, it appears that there are some soils and tracts of land in the world, where it is native, or is an original material. By absorbing from rains, dews, and putrid bodies, all the acidity they can impart, these beds of pot-ash change to nitre, which is in many places artificially extracted from the earthy matter with which it had been mingled and manufactured for use in several parts of Asia. This is the case in certain parts of Europe. But where nature has not bestowed a store of pot-ash to the earth, that salt is frequently accumulated there from adventitious and secondary causes. Near the settlements of men, pot-ash is generally produced by the agency of fire; and wherever soap is employed to aid common water in rendering substances clean, a quantity of alkali is thrown away with those solutions that have served the purposes of washing. Perhaps, too, as pot-ash seems to be a constituent part of some plants before they are subjected to the operation of fire, a portion of it is extricated by common pu-

trefaction. From these sources the earth, in the neighbourhood of human dwellings, and more especially large cities, becomes oftentimes highly nitrous. Where animal and vegetable matter accumulates, something of such a process may be expected to go on. This is so much the case, that TOURNEFORT relates, "the people "of some parts of Armenia carefully collect the dirt of the great "roads which are frequented by caravans of camels, which they "wash, and extract from it considerable quantities of nitre; while "the earth of the neighbouring fields yields no nitre." (Voyage au Levant, letter vii.) It would be needless to quote from LANCISI, that nitre is found in the soil of Rome; from BOURGOANNE, the abundance of it around Madrid; and other authorities proving the plenty of it in all the villages of Prussia. It is sufficient to say, the universal acid which joins the pot-ash forms nitre, and is subservient to the purposes of agriculture and the arts, when on the earth; but, as HUXHAM seems to have conjectured, (1 Observ. on Air, preface, p. xx.) oftentimes excites sad disturbance in the animal economy, and kindles up epidemic distempers after its elevation into the atmosphere. The operation of pot-ash, then, whether in the form of common ashes, tartar, soap-suds, &c. is twofold, 1st. It forms salt-petre with septic acid in the earth; and, 2dly. It consequently fixes the acid so that it can by no means rise in pestilential steam and vitiate the air. These facts, taken together, allow a theory to be formed of the effects of alkaline manures. They attract the acids of the soils, and, on combining with them, assume new qualities. Though they may, and do unite with fixed air into carbonates of pot-ash, yet the greater good done by manuring with alkalies, is the conversion of themselves to nitrites, by forming connections with the more strong and active septic acid. Too much of this unneutralized acid does harm even in the richest soils: this alkali, by saturating it, will bring them to a more productive condition. Where land is bare, and exhausted of organic matter, alkaline manures are not very profitable: there is no surplusage of acid to overcome, and, consequently, no new nutritious material produced by the union of the two into nitre.—The general conclusion, from what has been mentioned, is, that, in the street-manure of cities, the door-dirt of country-houses, the stable-dung of animals, &c. there is a portion of septic acid, which exists in close coherence with pot-ash, or in looser connection with some other material. Hence we can explain why *common ashes*, and *the ashes of lime-kilns*, are so serviceable as fertilizers when being mixed in the heap with *street manure*.

The next object of inquiry is, how the nitre of the soil operates? This question resolves itself into parts: 1st. The operation of nitre upon the soil itself, or the substances put on it for manure; and 2dly. Its effects upon the constitution and economy of plants.

1. Notwithstanding the firm alliance of septic acid and pot-ash, there is one substance by which it may be broken. This is the acid of sulphur, or vitriolic acid, which sometimes occurs naturally in the soil, but in modern husbandry is more frequently introduced in combination with lime, and spread upon the land in the form of gypsum. Nitre, it has been said, is composed of septic acid and pot-ash; gypsum consists of sulphuric acid and lime. If nitre and gypsum meet, then there will be a decomposition of both; the sulphuric acid of the gypsum will quit the lime, to form, with the pot-ash of the nitre, a vitriolated tartar; and the septic acid of the salt-petre will unite with the lime of the gypsum, into calcarious nitre, by the application of plaister of Paris. In such circumstances, the principal change wrought is the conversion of the septite of pot-ash, into a septite of lime; the septic acid in the latter case being more easy of separation and decomposition than in the former, and, of course, more favourable to the growth of plants. But of this, mention will be more particularly made under the 13th article below. The vitriolated tartar, or sulphite of pot-ash, has not any fertilizing effect that I know of. Sea-salt is almost always mixed with manures, in greater or less quantity; but as it is composed of the muriatic acid and soda, and as neither of these ingredients can decompose salt-petre, the two compound salts can exist in each other's neighbourhood, without undergoing decomposition on either side. 2dly. Besides the power already explained, by which plants are rendered capable of decompounding the septic acid when applied to them in a dilute form with water, they seem to possess a further power of separating this acid from its alkaline basis. There has been considerable diversity of opinions, as to the mode in which nitre operated as a manure. The facts appear to me reducible to the following heads. 1. The nitre may be wholly absorbed by certain plants, as perhaps in tobacco, without undergoing decomposition. 2. It may be decompounded, and the pot-ash chiefly be absorbed, as in wormwood. 3. After decomposition, the acid itself may perhaps be inhaled, and impart corroding qualities to the juices of plants, as in Euphorbium, Celandine, &c. 4. The septic acid may be resolved into its constituent parts, and the septon be retained in large proportion, as in cabbages; or, 5. The septon may be expelled in the form of azotic gas, and the oxygene remain as in sorrel, currants, &c. In so many ways may the septite of pot-ash operate, and impart the whole, or some part only of its ingredients, to the plants on which it acts, according to the appetite and disposition of each, determining them to retain one part or another, jointly or separately, as best suits their living economy in each particular case. Thus, the ancient opinion of nitre, as a fertilizing material in manure, is confirmed by modern experience and theory.

11. Septic acid may exist where there is no pot-ash; or there may be more acid than the pot-ash existing in the dung-heap or soil can neutralize. In such cases, the common salt, or muriate of soda, which is consumed in large quantities, by men and brute animals, and which is mingled more or less with beds of manure, may undergo decomposition. It was stated in the preceding article, that the pot-ash of the nitre restrained its acid, from making any coalition with the soda of the sea-salt. But the case will be different when no pot-ash is present, for then the alkaline basis of the common salt having a stronger attraction for the septic than for the muriatic acid, will dissolve its union with the latter, and form a more firm connection with the former. Under such circumstances, then, sea-salt will be changed to a septite of soda, (cubic nitre) and the muriatic acid will be set loose. And, in like circumstances, the same neutral salt will be formed from solutions of soap made of kelp or barilla. This same principle will be found to have an extensive application to all maritime situations, where the land is always in some degree impregnated with particles of sea-salt, elevated by the surf and winds, and borne to some distance through the air, or brought upon the land with the fodder cut upon salt marshes. The septite of soda is more easy of decomposition than salt-petre, and might, therefore, seem to be a preferable manure; to some plants it may be so, particularly to such as, by their incineration, afford that species of fixed alkali; but as this is not the case with the greater part of upland vegetables, the soda will be of little or no service, as it is not an article of their food; perhaps it is frequently of disservice. If gypsum, strewed upon land, meets with cubic nitre, it ought to be decompounded; the sulphuric acid of the gypsum uniting with the soda of the other compound salt, into a sulphite of soda, (Glauber's salt) and the septic acid combining with the earth of the plaister into a septite of lime (calcarious nitre). As to the action of the living economy of plants upon cubic nitre, it is the same, mutatis mutandis, with that already given in the preceding article, on the manner in which prismatic nitre or common salt-petre is affected.

12. The discussion of this article will involve a good deal of the theory of lime as a fertilizing substance in farming. From the greater abundance of lime, or calcarious earth, in and about human dwellings, and on farms, than of pot-ash, soda, and ammoniac, it might be presumed, a priori, that the septite of lime would be a very common production. This is the fact. Wherever, in the absence of the two alkalies, septic acid or its fumes meet with lime, calcarious nitre is formed. Lime is commonly exposed to putrid materials or their exhalations, in three forms; 1. That of quick or caustic lime. 2. Of mild or carbonated lime, or lime united with fixed air. And, 3. The sulphite of lime, gypsum, or plaister of Paris.

1. The common form in which lime-stone is found in the large strata of the earth, is that of combination with the acid of charcoal or fixed air. The lime is obtained from this in its distinct and caustic state, by exposure to a high degree of heat, whereby the carbonic acid is driven off in the state of gas. It is then called quick-lime, and, in that condition, is brought to market, and employed in husbandry and the arts. After having been deprived of its fixed air, the lime is always greedy of regaining it. This process goes on so certainly, that quick-lime, by being exposed to the open air, will grow mild again, by absorption of carbonic acid. From the avidity with which these two bodies associated, in ordinary circumstances, it has been imagined that quick-lime acted upon land or manures by promoting putrefaction; that is, by disorganizing animal and vegetable substances, and depriving them of their fixed air: this may be true in certain circumstances. A more common operation of the calcarious earth, is to neutralize the septic acid of the soil or dung-hill, temper its stimulant and corroding nature, and, in a junction of two caustic bodies, form that mild compound the septite of lime. If the carbonate of lime be thrown into a heap of manure, the fixed air will be expelled, and the septic acid take its place. Thus calcarious nitre is formed when quick-lime is employed as a manure upon land impregnated with putrefying matter.—Provided there is more lime than the septic acid can saturate, the surplusage may re-attract carbonic acid, if no stronger one prevents.

2. If mild lime be added instead of quick-lime, the septic acid will, as in the former case, constitute with it calcarious nitre; but will, in addition to this, cause an extrication of fixed air, which appears to act, when applied in a moderate quantity, both as a stimulant and nutritive ingredient of plants. But I must not digress by entering into a discussion of the effects of charcoal, its oxyd and acid, upon the vegetable economy.

3. The prodigious effects wrought by the sulphite of lime, or plaister of Paris, in many places, are matters of great profit as well as surprise to farmers. Specimens of a very pure gypsum have been brought to me from one of the western counties of the state of New-York. This must, in course of time, become of invaluable importance to that interior country, as well for architecture as for agriculture. The manner of its production seems to be this. Great quantities of sulphur are found thereabout. This frequently combines with clay and iron, into martial pyrites. Many varieties of this pyrites are prone to attract oxygene from the atmosphere, and when this happened, the sulphur was converted to vitriolic (sulphuric) acid, a part of which dissolved the iron, and formed green vitriol or copperas, (sulphite of iron); and the rest combined with the clay into alum (sulphite of clay.) When these processes

went on in the vicinity of great beds of lime-stone (carbonate of lime,) the calcarious earth gradually attracted the sulphuric acid from the iron and the clay, and in the course of ages, the strata of common lime-stone were converted into the sulphite of lime (gypsum.) The disengaged fixed air then flew away, while the iron and clay turned to ochre. Phenomena analogous to these have probably, in some former æras of the world, accompanied the formation of other masses of plaister of Paris. How, now, does such a sulphite of lime operate when employed as a manure? Its operation will be modified by the circumstances which accompany its application and modify its power. Gypsum may be decompounded several ways. 1. By the nitrite of pot-ash (salt-petre.) 2. By the nitrite of soda. And, 3. By the muriate of soda. 4. By the carbonate of pot-ash (mild vegetable alkali.) And, 5. The carbonate of soda (mild mineral alkali.) In any of these cases, one or other of which is likely to occur when gypsum is employed to promote vegetation, it will be generally decompounded. And upon this decomposition, it is not unlikely much of its value depends, in some cases of its application; and to the same cause may its want of success be ascribed, in others.

1. If the investigation, herein attempted, has any validity in it, the septite of pot-ash is a frequent production in manure. Gypsum, mingled with such manure, may be expected to undergo decomposition, by a double elective attraction: The pot-ash of the nitre attracting, by a stronger affinity, the sulphuric acid of the plaister of Paris, and forming a sulphite of pot-ash (vitriolated tartar,) and the disengaged septic acid joining the lime, and constituting a septite of lime (calcarious nitre.). This latter substance seems, in this case, to be the fertilizing ingredient. 2. If gypsum is sprinkled on a soil abounding with the septite of soda (cubic nitre,) it ought to be decompounded; and while the sulphuric acid joins the alkali, and forms a sulphite of soda, (Glauber's salt,) the septic acid constitutes, with the calcarious earth, a septite of lime. In this case too, calcarious nitre seems to be the active ingredient of the manure. 3. When the plaister is applied to a soil impregnated with common salt (muriate of soda,) a double decomposition may happen; the sulphuric acid forming with soda a Glauber's salt, and the muriatic acid making with the lime a muriate of lime. As neither of these substances is remarkable for promoting the growth of vegetables, the reason is plain, wherefore gypsum so often fails to fertilize land, in the neighbourhood of the ocean, or in any place where it can be decompounded by particles of sea-salt. But even on some farms in the state of New-York, bordering upon the salt water, gypsum will sometimes produce considerable effects; and these will depend, in some degree, upon the force and direction of the winds, bringing more or less

of the saline spray of the Atlantic along with them, and on the employment of salt-fodder on the farms. 4 and 5. Whenever the carbonates of pot-ash and soda are applied to gypsum, its sulphuric acid may combine with them into vitriolated tartar and Glauber's salt, then while part of their carbonic acid converts the basis of the plaister into a carbonate of lime, (mild calcarious earth,) the rest may mingle with water and other surrounding bodies, and contribute in those forms to nourish vegetables.

These rules, here investigated, will strictly apply to pure gypsum only. Under that name, a considerable variety of the sulphites of lime are brought to market and sold. Those varieties, I believe, are not merely such as result from the fibrous, lamellated, or amorphous structure of the gypseous material. They differ from each other further. 1. In the degree of purity: and, 2. In the force of chemical attraction, binding the ingredients together. In respect to the latter particular, there is something not wholly understood in the composition of gypsum; for though it can be tolerably well analyzed, there is a somewhat in the texture of some sorts of it, that cannot be perfectly arrived at or imitated by synthesis. The very considerable variety in the purity and cohesiveness of plaister of Paris is, no doubt, another cause of uncertainty in its operation, and of perplexity in theorizing upon it. And to this jointly, with the substances enumerated before, as capable of decomposing it, may be ascribed much of that irregularity approaching, as some term it, to something like whim or caprice, for which this manure is so remarkable. Septic and carbonic acids cannot decompound gypsum. If there is no alkali in the soil, I see not how it can be decompounded at all in manure. Perhaps it can answer a valuable purpose without decomposition. It may be so, though I question it very much. The formation of calcarious nitre seems to be the thing which characterizes the decomposition of gypsum, in cases where particularly the most benefit has been derived from it; and this corresponds with the great fertility imparted to land, by the same thing, in old walls, rubbish, &c.

13. If there be neither pot-ash, nor soda, nor lime, to lessen the vehemence and repress the activity of the septic acid and its vapours, the volatile alkali is the substance having the next degree of attractive force for them. The general opinion of philosophers, that ammoniac was the common and almost universal result of the putrefactive process, I believe to be a misconception. If it is such a common product of corruption as it has been alledged to be, it is very strange it should be so difficult of detection. No one will deny that it *may* be formed during the decay of organized matter; but this seems to be rather an unfrequent occurrence. Whenever volatile alkali meets with septic acid in the earth, which

I believe to be a very rare event, there will be a formation of nitrous ammoniac. The virtues of this as a manure have not been investigated that I know, further than respects the operation of *soot*, which contains it; and on this point more precise information is wanted than I am possessed of. From its easy decomposition the septite of ammoniac would seem to be a very operative ingredient in manure.

14. Septic acid has an attraction for clay. This, however, is so weak, that the presence of any of the substances already enumerated will prevent the connection, or dissolve it if made. In soils, therefore, where neither pot-ash, soda, lime nor ammoniac exists, nitrous allum may be formed, and contribute something to the productiveness of land.

15. The union of the acid of putrefaction with oily substances includes both the case of the rejected water of wash-houses, and the corruption of organized bodies. The greasy part of soap, the adipose matter of carcases, the oily substance of certain seeds, &c. are all capable of being changed into new forms by the operation of septic acid. By this they seem to be modified in such a way as to afford healthy aliment to many sorts of vegetables.

Such are the methods by which this active and abundant product of corruption is overcome and kept within tolerable compass. Some substances only neutralize it; others again rend it asunder, and dissever element from element. But the processes I have exhibited, though they are the principal which agriculture furnishes, are not the whole which nature has provided for the destruction of septic acid; for it acts with more eagerness upon other bodies, and on a greater variety of them than other acids, chiefly on account of its being of more easy decomposition. The dissolution of silver, the explosion of gun-powder, the deflagration of nitre, are all of them processes of a similar kind. As the quantity produced is prodigious, so the means of destroying it are adequate, and, upon the whole, well adjusted.

On this occasion, I wish to avoid the censure of ascribing too much to one principle or thing. I would not be understood as giving an entire theory of manures: all that is intended is to bring to view, and to interpret the history of septon, and its compounds, in some of their relations to physic and farming. Nor would I incur the charge of saying these things are the only pabula plantarum. Partial views in abundance are already before the public, in favour of attenuated earth, water, hydrogene, carbone, &c. I believe all these have their effect. But, as they have each been treated of more particularly than the septic substances have, I merely undertook the statement of the subject, as far as these latter were concerned, in such a manner as appeared to me to be just.

The acid properties of some manures, and the alkaline or absorbent nature of others, highly deserve the consideration of agriculturists. Without an attention to the action of the former of these upon the latter, the formation of manures, and their operation upon plants, cannot be understood. These might easily be reduced to a small table, and their affinities traced.

Acids commonly present in manures.	*Alkalies very frequent in manures.*
Septic, or nitric acid.	*Pot-ash*, or *vegetable* fixed alkali, very common.
Carbonic acid, or fixed air, both very common.	*Soda*, or mineral alkali.
Sulphuric acid, sometimes.	*Ammoniac*, or volatile alkali, now and then.
Muriatic acid, very frequent in the neighbourhood of the ocean, and abounding on farms where much salt fodder is consumed.	*Lime*, or calcarious earth, very common indeed.
Phosphoric acid, not unfrequently evolved during animal decomposition.	*Magnesia*, sometimes.
	Clay, almost always.

But to return to the subject of sickly air. As the vapour issuing from *putrid* substances is occasionally of an acid nature, the alkalies will, under all possible circumstances, unite with it, and neutralize it. This is a *composition of septon with oxygene*, which, according to abundance of experiments, form the effluvium of high animal putrefaction. This vapour has been called *putrid*, and supposed to act as a *ferment* in corrupting the fluids, &c. of the living body. Such an opinion, besides being a violation of all sound reasoning, is entirely contradicted and refuted by the experiments made long ago by ALEXANDER in Scotland, and now lately by BRUGNATELLI in Italy: whence it is proved, that both *water* and *air*, tainted with *putrid effluvia*, not only do not promote putrefaction like *atmospherical air* and *common water*, but acquire therefrom a power of *retarding and resisting the corruption of dead animal substances, in an eminent degree*. In such atmospheres, so little favourable to the putrefaction of substances, do pestilential, malignant, endemic and epidemic disorders prevail. But the unwholesome exhalations do not act by promoting directly a *putrefactive fermentation* in the body, but by *morbid* or *excessive* stimulation, causing inordinate or violent excitement, and thus inducing disease and death.

In these modes does it appear, that the volatility of acid exhalations is repressed, and their causticity blunted by the more

fixed and strongly neutralizing qualities of the alkalies; that, in proportion to the nature of the compounds formed by the union of these with each other, or with yet other substances, will the products be various, and impregnate the soil accordingly; and from the composition and character of these, will the land, in a good degree, derive its productiveness or sterility, and the climate no inconsiderable share of its salubrity or unwholesomeness.

New-York, July 1, 1797.

ARTICLE III.

[Recommended to all who have read the Treatises on Epidemical Diseases written by Doctor SYDENHAM.]

Doctor MORTON's *Summary of the History of the continued Fever in England, from* 1658 *to* 1691; *being the Appendix to the second Exercise of his* Πυρετολογια, *p.* 415 *&* *seq.*—Translated from the original Latin for the Medical Repository.

I SHALL begin from the year 1658, an æra I well remember, when this fever, both in its spurious and simple form, prevailed throughout all England, particularly in the autumnal months; as our celebrated Willis has testified in his treatise of fever, formerly published. Oliver Cromwell, who at that time was protector of England, and my revered father, a very experienced physician, both died that year, of this fever, about the beginning of September, when it arrived to its height: the synocha, in both cases, as the powers of nature gave out, turning to synochus, with delirium, spasms, and other symptoms of high malignity. And even then, after I had beheld my mother, brothers and sisters, the men-servants, the maid-servants, the nurses, and every body within the house, and almost every person in the same and the neighbouring parishes, infected and laying sick with this poison, I remember well, and I have reason to remember it, that I myself was taken ill of the same distemper, and after a narrow escape from death, on the first attack, I was three months slowly recovering; the *continued fever*, with which I was first affected, turning into a *quotidian*, and then into a *tertian intermittent*, after the poison had been subdued by a long-continued and repeated expansion of the spirits. At this time, almost the whole of this island (Great-Britain,) especially in the autumnal months, resembled an hospital; and, in some places, such was the amount of sickness, that there was not well persons enough to take care of the sick. It is, however, very certain, that this fever, though so extensively epidemic, was less fatal than the pestilential or malignant fever commonly is, because it arose from a milder poison. Whence it came to pass, either by the expansive power of the spirits, or the assistance, such as it was, afforded by art, (for as yet the efficacy of the bark, in overcoming the power of this poison, had never been proved among us, at least,) a great many recovered from the distemper, though slowly. But you might see, almost every where, persons, after the sixth or seventh exacerbation,

(where nature had been forced, at last, to yield to the increased violence of the poison,) having no more fits and remissions, nor any trace of them, seized with malignant continual fever, accompanied with horrid spasms and delirium, carried off in the seventeenth or twentieth day of the disease. Others were, as it were, prematurely cut off, by a *diarrhœa* and *vomiting*, or pains like those of *pleurisy*, *peripneumony* or *colic*; or, worn down and exhausted by some more violent symptom of the *spurious synocha*, died on the seventh, ninth, or eleventh day of the distemper. Besides, of those who escaped from the diseases, almost all that I knew of, passed the winter in the sickly way; for even during the coldest weather, quartan, tertian, and quotidian intermittents, arising from a more moderate quantity of the same poison, were almost as epidemic as continued and remittent fevers had been in the fall. Nor, indeed, during the prevalence of the frost, did these synochas entirely leave us, but though they were not epidemic, as the preceding autumn, they every where appeared sporadically, during the next spring and summer, until the month of August. From this time, and the whole course of the autumnal months, they on all sides increased, and became epidemic again. And thus I observed this fever to be very general under the forms of a simple and proper synocha, and under a quotidian and tertian type, and during the fall, to be more or less epidemic, until the year 1664; during which period, it was fatal to a great many, notwithstanding the dogmatic and exquisite method of treatment which then prevailed; the efficacy of this Peruvian antidote, in destroying this poisonous ferment, being yet unknown to the common herd of prescribers.

At the beginning of the autumn of the year 1664, this fever had nearly disappeared; and almost all acute diseases had suddenly vanished; and the constitution of the season became very wholesome. But on the return of spring, after an uncommonly severe winter, and a comet in the Heavens, the fore-runner, as it were, of this calamity, the poison gathering fresh strength, and increasing prodigiously, unexpectedly changed this synocha to a most dreadful and destructive plague, which, spreading epidemically, killed, in the duration of one year, more than forty thousand persons. Yet, during the rage of this plague, vestiges of the synocha were not wanting; for as many as escaped from the plague, either by the efforts of nature or the aid of art, and began to exhibit buboes, parotides and carbuncles, or other monuments and trophies of victory over the enemy, experienced in themselves, as if by a milder operation of the poison, or greater vigour of spirits, every day, or every other day, exacerbations and remissions of these symptoms, alternating with each other, at stated hours. Whence, I think the medical faculty of Naples are not justly chargeable with rashness, (as Badi relates, Anastas. lib. i. chap. 20,) in hav-

ing ordered the Peruvian bark to be prescribed in the cure of plague; and it may contribute a great deal to destroy this poison, (when of a milder sort) and afterwards hasten the cure.

Moreover, this dismal plague, disappearing about the beginning of the year 1666, the synocha fever, occasioned by a milder poison, began to shew itself, attended with painful and dysenteric flux. From the beginning of August, it spread and grew worse and worse, through all the autumnal months. I was infected by it myself, as I caught the distemper from incautiously examining a dysenterio stool, and, with difficulty, recovered from it: and so violently and epidemically did this malady prevail in London, that the next fall I had another attack of the disorder, induced by a similar accident. But, during its height, in the months of September and October, at which times the simple synocha ordinarily prevailed, there was scarcely any other disorder to be seen. Almost the whole city was down with it, and every week, from 300 to 400 and 500, were carried off by fluxes and gripes, and the other dreadful symptoms of excruciating dysentery, or colliquative diarrhœa, on or about the 14th, 17th, or 20th days of their illness, accompanied with unquenchable thirst, white or black aphthæ, quick pulse, delirium, and other tokens of the epidemic fever. Many, however, after the looseness and griping, and other symptoms of dysentery had been suppressed, by the plentiful use of opiates and astringents, nevertheless languished and lingered along, until emaciated and burned up almost, they fell into a fatal hectic. I remember others who were preserved (the virulence being critically expelled by the salivary ducts) by the appearance of aphthæ, and profuse salivation, (which frequently comes on at the crisis of the synocha.) Then, again, the poison, taking on itself the form of an epidemic dysentery, spontaneously attacked the intestines with the violence of colocynth, or any other cathartic; excited in them perpetually horrid and vellicating spasms, and causing a copious effusion of colliquated and poisonous serum through their glandular membrane, induced a considerable exhaustion of strength, but not so great but that nature, after stated or uncertain periods, especially in the beginning of the disease, would recruit a little, collect force, make a stand, and sometimes gain a victory. This was very easy to be observed; for a remission and exacerbation of the gripings, looseness, and other tormenting symptoms, were plainly observed to return duly on every other day. During the remission, all the excruciating symptoms were sometimes spontaneously mitigated; but, on the return of the fit, they were not to be restrained by the powers of opiates themselves. Whence I clearly discerned, that the dysentery was but a symptom, and that the fever, (howsoever it might, by reason of the suppression of external heat, by the griping and looseness, conceal itself from the observer,)

even of the true synocha type, was the primary disease, and arose from a more mild poison, operating in this instance like a cathartic. And, at last, relying firmly upon this observation, I undertook a new method of treatment. Before this, I had been engaged with the rest of the medical practisers, in vain attempts to overcome the disease, by rhubarb, myrobalans, opiates, and astringents externally exhibited, as well as by anodyne clysters, fomentations, and other things of high name, and warmly recommended by authors for the cure of dysentery; while, during all my efforts to allay their wretched symptoms, the poisonous ferment was lurking within the body. In addition to opiates and astringents, which merely regard the dysenteric symptoms, I determined to employ some more po[illegible]ful febrifuge, (if I could find such an one) which, by destroying the poisonous ferment of the fever, and the cause of the looseness, would, at once, be capable of removing the fever, stopping the flux, and, of course, allaying the gripings. And my mind was the more inclined to this opinion, because I had often observed the miserable patients, notwithstanding the most antidysenteric remedies, exhausted with these most severe symptoms, until at last they died upon the close-stool; while others, driven, by many astringents and opiates, to delirium and fainting, and made drunk rather than well by them, frequently suffered an unexpected return of the dysenteric symptoms; and becoming emaciated, with a quick pulse, hectic heat, and other tokens of a poisonous taint lurking in the constitution, at last expired in a state of quietness and costiveness of the bowels. Judging from the alternating exacerbation and remission of the griping and flux, (which I had long ago often known in some form or other to accompany this disease, at least in its beginning,) rather than from the feverish heat, which, in proportion to the troublesome symptoms, I found to be, in some degree, unequal, but always low and moderate; in such cases, I determined to try the powers of the Peruvian bark, mixed with laudanum. Nor was this rashly done, since, however prone the bark may be to purge, by irritating the tender intestines by its bitterness; yet, when mixed and obtunded by laudanum, which stops the running off of the juices, and blunts and stupifies the exquisite feelings of the guts, it may be reckoned a proper remedy to all, and compose the flux and griping, as well as the fever, by subduing the colliquative poisonous ferment. I first experienced the efficacy of this most celebrated febrifuge in dysentery, in a patient living in *Long-lane*, who laboured under a *tertian* dysentery; for some cases of this sort occurred to me in practice, where gripings and a slimy bloody flux returned every third day, at a stated hour, notwithstanding the most diligent exhibition of *opiates;* while, in the intervals, these cruel symptoms were mitigated by administering a small dose of laudanum, or oftentimes of their

own accord. Seizing, therefore, the first opportunities of a remission of the symptoms, I ordered, without delay, a drachm of bark with a grain of London laudanum, to be taken in the form of a draught, and repeated every fourth hour, until six doses had been administered. What was the consequence? So far was the bark from irritating the intestines by its bitterness, that I immediately perceived they were more effectually composed and appeased by laudanum mixed with the bark, than joined to astringents; for, from the exhibition of the fifth or sixth draught, the flux and griping, together with the fever and other accompanying symptoms, entirely went off, and never returned at the accustomed periods. This observation encouraged me to try the powers of this sovereign remedy in *quotidian* dysenteries, as often, and as long as they took upon themselves the synocha type, though, with some irregularity, in the exarcerbation and remission of symptoms, and they were not of the *malignant* kind. Nor did the event disappoint my expectation: and I have no doubt, that every epidemic flux, and every looseness, connected with fever, even *camp fevers*, accompanied, as they generally are, with similar symptoms, to wit, the spurious synochas, might be much more certainly cured in this short way, than by the formidable apparatus of *rhubarb*, *myrobalans*, *astringents*, and *opiates*, which have hitherto made up the treatment of these kinds of diseases. But of these things I shall speak more at large, in my fifth Essay on *colliquative* fevers. At present I only mention them, that I may shew, that the *dysentery* and *griping diarrhœa*, which lasted near seven years, and renewing its violence here in London, raged epidemically almost over the whole country, from the year 1666, to 1672, arose from a true synocha, which I denominate a spurious synocha, because it was connected with a more violent colliquation of the juices, and their excretion by the intestines. And, indeed, it was a favourite wish of mine, that from the true and genuine idea of this disease thus formed, more certain indications of cure should be thenceforward derived; so that the *camp flux* and *dysentery*, or any other epidemic, should be designated by the proper name of *spurious and colliquative synocha*.

As the genuine synocha, from the year 1665, (when, from the working up of the poison to its height, the plague broke out,) disappeared for almost two years, and did not return, as before, with the return of warm weather; in like manner, this *spurious and colliquative synocha*, called by the name of the *griping dysentery and flux*, which succeeded the plague, and returning every autumn, continued to exercise its virulence, far and near, in these parts, did at last entirely cease. But it was succeeded by the epidemic measles, which, like a milder plague, sparing neither age nor sex, prevailed

with such mortality in London, in the fall of 1672, that there died about three hundred a week of it. But these never afterwards existed with so great a degree of virulence. In what degree however, this same *pestilential* and *epidemic morbillous fever*, after arriving to its height (that is, where the event was to be fortunate,) resembled the synocha form of fever, and how excellently the Peruvian bark succeeded in the cure of it, will be afterwards related in its proper place; to wit, in the second chapter of my third essay, where I shall professedly treat of the measles and scarlet fever.

Toward the close of winter, this morbillous constitution began to decline, after a duration of six months, and at length entirely ceased, leaving the febrile poison, in 1673, considerably more mild and moderate, as it still continues to be. Whence it happens, that the fever which hitherto raged annually from the month of August to the winter solstice, no longer put on the appearance of griping diarrhœa or dysentery, nor was accompanied with any other more violent symptom; but for twenty years wore the same appearance as it did before the breaking out of the plague of 1665 and 1666: and it is not improbable it will continue to observe that type, until, by some fatal plague, the poisonous ferment shall be changed, and exalted to a more deleterious degree of virulence. I confess indeed, that in some years, from a milder degree of the poison, particularly from 1677 to 1682, that quotidian intermittents, tertians and quartans, were nearly as epidemic as the synochas; and that, in later years, particularly during the height of the constitution, in the months of September and October, the very synochas, from a more irritating degree of the poison than usual, were sometimes attended with some more violent symptom, which did not only take on *the form of a periodical flux* and *dysentery*, but also of *cholera morbus*, *excessive vomiting*, *flying rheumatism*, *pleurisy*, *colic pains of the stomach and intestines*, or of some other very acute disease; and that these synochas, when not seasonably and properly treated, often, from an increase of the poison, degenerated into *malignant* and fatal fevers; and even sometimes, by reason of an unusually deleterious degree of the poison, indicated *malignancy* from the beginning, being of the *purple* or petechial kind, and distinguished by a morbillous eruption, watery blisters scattered over the neck and breast, parotides, buboes, carbuncles, and other malignant symptoms. But all these fevers, whether spurious, synochas, or malignant, were also *sporadic*, and did not spread by contagion, as in the pestilential constitution. The only epidemic fever which I have observed regularly to return every fall, for twenty years past, was the *simple synocha*, which always yielded to the bark when seasonably administered. Nor did the epidemic constitution or influence of smallpox, erysipelas, scarlet fever, rheumatism, sore-throat, pleurisy,

or any other, which prevailed at any season of the year, make so considerable a change in the autumnal poison, that the epidemic fever proceeding from it, changed at all its usual type in such a course of years, or went through its stages after a new and varied manner.

IT is matter of equal curiosity and instruction to observe the varied shapes and degrees, under which Doctor MORTON has so acutely detected the operation of a single noxious principle. Equal sagacity and diligence of observation would often certainly lead to the same result. The history of diseases in our own country, for some years past, furnishes so many circumstances of a correspondent aspect, that no person can avoid being struck with the resemblance.

By this attention to the extensive operation of a single morbid power, we not only enlarge our acquaintance with the nature, origin, and causes of diseases, but receive important lessons concerning the prevention and treatment of them. Instead of wandering to foreign countries to trace the source of contagion, or multiplying morbid causes without end, we discover the materials of mischief growing up and acquiring malignity under our own eyes; and we learn to acquiesce in the simplicity of nature, and only to distinguish when she has established a real difference.

It is probable, if medical history were sufficiently ample and authentic to enable us to compare the phenomena of diseases, as they have existed in all ages and countries, we should find much more ground for the same inferences, which arise from this remarkable chapter of Doctor MORTON's work.

ARTICLE IV.

REMARKS ON THE CHOLERA, OR BILIOUS DIARRHŒA OF INFANTS.

By EDWARD MILLER, *M. D.*

THE Cholera of infants forms one branch of a large stock of diseases, as much distinguished for the universality of their appearance, as for the diversified character they occasionally assume. Another form of them, more familiarly recognized by the public, is that of remittent and intermittent fevers. On account of circumstances, which every body is acquainted with, they have attracted, for several years past, much more attention than usual. Views of the subject, more comprehensive and accurate, have enlarged the number of them, by bringing back to their proper station many diseases, formerly so much disguised in external appearances, as to conceal the fact of their radical relation. And it will not be surprising, if this simplification should be carried much farther; nor if our successors should groupe together a still larger assemblage of diseases, and demonstrate their origin from one common cause.

Notices of the cholera of infants are to be found in almost all the writers, who record the annual epidemics of summer and autumn, in sickly countries. Cleghorn, in his account of the diseases of Minorca, describes it exactly as it appears in the United States, invading children some weeks sooner in the season than similar affections are discovered in adults; which he properly ascribes to their greater excitability, and to the remarkable tenderness of the alimentary canal in the infantile system.

The importance of the subject now undertaken, is admitted by every physician. For, notwithstanding the nature of the disease is, at present, well understood, and the treatment greatly improved, it still continues, particularly in the southern and middle states, to destroy multitudes of infants, and even, in more favourable cases, to prove, in a high degree, obstinate and distressing.

An interesting account of the cholera of infants, by Dr. Rush, has been many years before the public.* His description of it is so accurate, that, after much attention to the disease, I am unable to add any thing which, in that respect, deserves to be considered important. His account of the nature and causes of this complaint,

* Medical Inquiries and Observations, vol. i. p. 112.

of the relation it bears to some others, and of the mistakes that have prevailed on this point, is so just, that it has been commonly adopted. The mode of treatment he recommends is very judicious, and has been generally received. But, as this valuable book is in the hands of almost all our medical practitioners, it would be an abuse of their time to repeat these things here. I shall not, therefore, attempt to give any history of the disease, nor propose any general plan of treatment, or any minute detail of remedies. My observations will be confined to a few detached points, which have appeared to me to be important; and they will be often so irregular, and desultory, that this paper can be considered, at most, only as a brief supplement to former essays on the same subject.

The physicians of the United States seem generally to concur in opinion, that a retreat from an unhealthy situation, and particularly a change from the air of cities to some salutary part of the adjacent country, is one of the best means both to prevent and cure this disease. The evidence in favour of this opinion is such, that we shall take it for granted, and only propose the application of the treatment we have in view, in cases where the change of air cannot be obtained.

It is well known, that the situations and circumstances of a large proportion of the community are such, as necessarily to fix them in the spot where they happen to reside. In this case, the best exertions must be made that the nature of the affair will admit.

As the first indication that presents itself, in the treatment of this disease, is to discharge the stomach and intestines of their acrid and offensive contents, great difficulty often occurs in the outset, as to the choice of the means to effect this purpose. When the stomach is excited into action so inverted, convulsive and violent, the administration of emetics will be often thought hazardous. And if a thorough evacuation of the offending matter shall appear to have been already accomplished by spontaneous vomiting, or if the disease shall have invaded with great violence, and already have produced great prostration of strength, feebleness of pulse, and a receding of heat from the extremities, an emetic would certainly be improper and unsafe. The violent action of the stomach should always be suffered to subside before such a remedy as this can be attempted with propriety.

But however mischievous the rash interposition of this remedy may often prove, the maxim that vomiting should never be employed to relieve vomiting, has been sometimes maintained in a sense far too general and unqualified. Mild emetics, which soon cease to operate, will often leave the stomach stronger than before. This is attributed, by Dr. Darwin, to the accumulation of excitability during the stomach's inverted action.* It may also, per-

* Zoonomia, vol. ii. p. 57.

haps, be in part ascribed to the difference in the modes of action, which take place in spontaneous and in artificial vomiting.

To relieve, however, any doubt on this subject, whenever the state of the stomach and intestines is found to require evacuation, a more safe and unequivocal means of effecting the purpose, it is conceived, may be found in the use of calomel, accommodated in its dose to the age of the patient, and to other circumstances. And as long as mere evacuation can be requisite or admissible, this medicine, uncombined, will prove efficacious, gentle and safe. As soon as the profuseness or sufficiency of the discharges, or symptoms of debility, admonish to support the strength, the addition of opium to the calomel, in suitable quantity to compose the stomach and bowels, forms, in my judgment, one of the most powerful remedies ever employed in this disease.

To recommend the trial of mercury, alone or combined with opium, as different states and exigencies of this disorder may require, is one of the principal objects of this paper. A case of infantile cholera, very violent and protracted, attended with dysenteric symptoms, first induced me to make trial of this remedy, according to Dr. Clark's plan of treating chronic dysentery.* It succeeded so completely, that I soon extended the use of it to the bilious diarrhœa of children; and here it answered as happily as before. Some of my medical friends have since made trial of it, and, they assure me, with singular advantage. If with others the same benefit should result, it will certainly not be thought unworthy of being recommended to the public; and, if future experience should find me too sanguine in my estimation of this medicine, this brief paper will, at most, add but little to the mass of hasty and injudicious encomiums bestowed on favourite remedies.

As to the dose of this medicine, or the interval of repetition, it is difficult to speak with precision, considering the variety of circumstances which must always determine questions of that sort. It will, perhaps, convey an idea, sufficiently explicit, of the mode of exhibiting this remedy, to observe, that from an eighth part of a grain to one grain of calomel, combined with a portion of opium, from a twentieth part of a grain to half a grain, repeated every 2d, 4th, 6th, or 8th hour, will comprize nearly all the range of variety necessary in the treatment of this disease, in order to accommodate the medicine to all the circumstances of age, constitution, and habits, as well as the endless differences in the state and degree of the complaint, in the concourse and succession of symptoms, &c †

* Diseases of Hot Climates.

† To be more particular—a child about two years old may take a pill composed of one-fixth part of a grain of opium, and one-third part of a grain of calomel, every 2d, 4th, or 6th hour, or sometimes oftener, according to the

It will scarcely be necessary here to observe, that not only the relative quantities of these ingredients require to be continually varied in order to meet the ever-varying circumstances above-mentioned, but that frequently one or the other article should be entirely omitted, accordingly as evacuation or astriction of the alimentary canal, or greater or less degrees of either, may be held in view.

The form of pill was commonly preferred, in prescribing this medicine. If the child was too young to swallow an entire pill, it was directed to be broken into small fragments, and given in any pleasant vehicle, liquid enough to be readily taken without adhering to the mouth, and of sufficient consistence to entangle the small pieces of the pill. When it was necessary to depart from this mode, the addition of a little white sugar, and of a small portion of some aromatic, easily formed powders of a convenient size.

The following advantages seem to attend the use of this medicine.

1. The facility of exhibition. Neither article, when properly enveloped, is nauseating—the smallness of the bulk, and the agreeable form into which it may be reduced, remove every difficulty. The trouble of giving unpalatable remedies to children is experienced every day; and the trouble increases with the bulk. Impressions on the senses frequently affect the stomach, especially when enfeebled by disease; hence a disagreeable taste or smell will sometimes so instantaneously produce the rejection of an article attempted to be swallowed.

2. The difficulty of dislodging it from the stomach by the utmost violence of vomiting. The great specific gravity of the calomel seems to favour the retention of the opium, as well as of itself, on the stomach.

3. By this combination, much more of each ingredient, active and powerful as they always are, can be safely and advantageously given, than in a separate state. They evidently correct, regulate, and soften the powers of one another.

4. It is calculated to obviate the most fatal tendencies of the disease. When a fatal termination takes place at any other than a very early period, there is ground to conjecture that effusion in the head, or destruction of the organization of the stomach or bowels, commonly takes place. The symptoms of determination to the head render the former probable; and the inflammatory, dysenteric, and gangrenous appearances leave little doubt of the latter.

urgency of the symptoms. If much evacuation be wished, the above quantity of calomel is too small; if much astriction be desired, and the intestines be very irritable, it will be too large. And so also, vice versâ, with respect to the opium.

That mercury is well adapted to prevent consequences such as these, will be readily agreed.

5. Calomel, combined with opium, and especially when exhibited in small doses, excites a strong absorbent action, with respect to the fluids poured into the stomach and intestines. Most of the metallic salts possess more or less of the same power. The degree of absorption effected by the combination of calomel and opium will probably be in proportion to the quantity and completeness of the evacuations previously made by the calomel alone, or other evacuant means; as absorptions in general are increased by inanition.

It will be difficult, we conceive, to appreciate the virtues of calomel in the cholera of children, unless we hold in constant view the quantity, vitiation, and acrimony of the contents of the stomach and bowels. When the intestines are so enfeebled and diseased, a diarrhœa may be present for many days, even for weeks; and yet excrementitious matters may collect and remain in such quantity as to produce the greatest mischief by their putridity and excessive stimulation. In what manner shall we venture to expel this matter? Physicians generally agree, that calomel, though commonly safe and gentle in operation, is the most penetrating, detersive, and effectual of all the means employed to cleanse the intestinal canal; that it dislodges substances not to be moved by other purgatives; and often discharges more bilious and other acrid matter of every description at one, than other cathartics at several evacuations. It results then from all this, that in calomel alone, we possess an excellent evacuant in the diseases denominated bilious; and that in calomel, joined to opium, we have a medicine of still higher value.

Cases may, perhaps, occur, of such irritability, in the alimentary canal, that no portion of calomel can be borne, even in connection with opium. Such cases, indeed, we have not yet met with; but supposing them to happen, we should advise, without hesitation, the external application of mercury.

Upon the whole, we think ourselves warranted in ascribing a superior efficacy to the action of mercury and opium, in the cholera of children. The common mode of treatment appears comparatively superficial and palliative; and, of consequence, the effects of it are transient; while mercury, penetrating to the inmost recesses of the disease, and disarming it of all malignity, effectuates a cure, at once radical, durable, and complete. Opiates alone, so generally used, and so much confided in, afford only a short-lived, delusive repose in this tumult of the system.

If it were necessary to fortify, by authorities, the mode of treatment here proposed, it would be sufficient to mention the names of Doctor Cleghorn* and Doctor Clark,† who place a principal reli-

* Diseases of Minorca. † Diseases of Hot Climates.

ance on a combination of calomel and opium, in the worst forms of dysentery. Doctor Lysons* relates a number of cases of the efficacy of a similar composition in the bilious diarrhœa of adults. Doctor Chisholm† depended chiefly on the same medicine, given in such manner as to produce a rapid ptyalism, in the malignant fever of Boullam. Doctor C. Smyth employed the same combination to relieve the formidable symptom of vomiting, and found it successful, when all other means had failed, in the jail distemper.‡ And Doctor Armstrong used, with signal advantage, a composition, substantially the same, in the disease of infants which he denominates the *watery gripes*.§ The efficacy of mercury, also, in the malignant fevers of our own country, within a few years, is, I presume, too well known to need being mentioned in this place.

In the advanced stages of the cholera of children, the virtue of allum deserves much commendation. All acrid and offensive matter should, as much as possible, be removed before the use of it be attempted. It is thought a necessary caution to begin with it in very small doses, as half a grain, conjoined with opium, and gradually to increase them. It possesses the great advantage of small bulk, and of easy envelopement in a pill.

To the preceding observations, we now proceed to subjoin some remarks on the management of the state and temperature of the skin in this disease. It would be difficult to point out any branch of medical attention so much neglected as this has too generally been. The importance of it in all febrile diseases, is unquestionable. In the principles, however, which ought to guide our conduct on this point, we are still sorry to find too much indefiniteness and ambiguity. And although we are persuaded many firm and decisive steps may be taken beyond the common practice at this time, we are not, at present, prepared to state the limits, or deliver the rules which should invariably govern this subject.

As the cholera of children is a febrile disease, and the surface of the body, often heated far beyond the proper point, it will be adviseable to expose all such parts of the skin as feel too warm to the hand, to a stream of cool air, or to bathe them in cool water. Several times a day the patient should be washed with vinegar and water, salt and water, or water alone, by means of a sponge, as he lies in bed, with as little motion, disturbance, or fatigue, as possible. Considerable inequality, as to the heat of different parts of the body, is often observed. If some parts, as the extremities, be too cold, they should be covered with flannel; if other parts, as the

* Practical Essays.
† Essay on Malignant Fever of Boullam.
‡ Description of Jail Distemper, p. 126.
§ Diseases of Children, p. 45.

face, breast, &c. be too warm, they should be cooled by a stream of cold air, or by bathing them, as before directed.*

As to the temperature of the water to be employed for this purpose, there must be much latitude of discretion in different circumstances, as there will be much diversity of opinion in the same circumstances. We believe, it may be safely affirmed, that any temperature of a bath, at, or a few degrees below, the healthy standard of heat, in the human body, will produce a speedy and considerable abatement of febrile heat on the skin. And we have direct conclusive experiments to prove, that such a bath, from 95 to 85 degrees of Fahrenheit's thermometer, when duly applied to the skin, morbidly hot, will powerfully diminish the celerity of the pulse, and the heat of the body. But, wherever these tepid or cool degrees of the bath do not sufficiently carry off the heat, the use of colder water should certainly be enjoined; directing the successive reductions of temperature to be gradually performed. And in cases where a determination to the head is indicated by unusual heat of that part, by turgescence and redness of the face, redness of the eyes, delirium, &c. the coldest water should be applied; and, if this fail, powdered ice in a bladder, as recommended by Doctor Rush in yellow fever.†

It would require much detail to enumerate all the advantages of these applications. Besides obviating dangerous determinations, and affording great refreshment, they save a great expenditure of excitability, and thereby preserve, from an unavailing and noxious waste, such a portion of vital power, as may become extremely important in the perilous, doubtful, and protracted struggles of the system with this disease.

It would be improper here to pass without notice the efficacy of cold water, or iced water, as the severity of the case may require, injected into the bowels. This operates powerfully, as an anodyne, sedative, and antispasmodic. Besides actual experience, a striking analogy in favour of this remedy is presented by the instantaneous relief it affords in the retrograde motions of the alimentary canal, which take place in hysteria, mentioned by Dr. Darwin as recommended by Mons. Pomme. Dr. Darwin explains the relief produced in this case by supposing "the inverted motions of the intestinal canal to be checked by the torpor occasioned by cold; or that one end of the intestinal canal may become strengthened, and regain its peristaltic motion by reverse sympathy, when the other end is rendered torpid by ice-water." This remedy, though generally adviseable, appears to be most adapted to that state of the disease, when the alimentary canal

* Darwin's Zoonomia, vol. ii. p. 218.
† Medical Inquiries and Observations, vol. iv. p. 91.

has been previously well emptied of its acrid and offensive contents.*

In addition to the common applications to the epigastrium, or other convenient parts, blisters are well adapted to effect a change in the state of the alimentary canal. If the propriety of applying them in the early part of the disease be doubted, they must be thought unequivocally proper, after the canal shall have been emptied of its impurities, and the skin become generally cooler and paler than at the beginning. Sinapisms would probably answer very well in many cases; they are less painful and troublesome than blisters; and, if not suffered to lie on too long, will produce no disagreeable effects.

When the disease is sufficiently subdued, and the retentive powers of the stomach re-established, it will be necessary to have recourse to the common corroborant remedies of the vegetable kind. Among these, none have succeeded so well, in my hands, as infusions or decoctions of Columbo root, or Angustura bark.

* The Spaniſh phyſicians (ſays Cleghorn) have often aſſured me, that they found nothing more beneficial in violent deplorable choleras, than drinking of COLD WATER. The ſame practice is recommended by many of the ancients. Sin autem omnia antiqua ſtercora dejecta fuerint, et bilioſi humores tranſierint, billoſuſque vomitus et diſtenſio adſit, faſtidium, anxietas, virium labefactatio, tunc frigidæ aquæ cyathi duo aut tres propinandi ſunt ad ventris aſtrictionem, ut retrogradus humorum curſus cohibeatur, atque ſtomachus ardens refrigeretur. Aſſidue vero id, quum potam aquam vomuerit, facito. Aret. Cappad. de curat. M. A. l. ii. c. iv. See likewiſe Cæl. Aurel. de morb. acut. l. iii. c. xxi. Cleghorn's Diſeaſes of Minorca, p. 243.

ARTICLE V.

The Speech of FOURCROY *in the* Council of Ancients, *delivered in the Session of the* 10*th of Ventose, (February* 28, 1797*) on "the Resolution relative to Powder and Salt-petre Manufactories." Translated, from* The National Gazette or Universal Monitor, *of the* 5*th of March*, 1797, *for the* MEDICAL REPOSITORY.

I HAVE reflected on the objections which have been made to the Resolution under consideration. I foresaw that they would be suggested: they have often occurred to my own mind; but an attentive examination has never failed to convince me that none of them ought to prevent the adoption of this Resolution. Some are unfounded; others are feeble; and, as to the importance of others, they are so intimately interwoven with the very nature of things, that they would equally apply to any law which could be proposed.

It is desired that the manufacturers of salt-petre shall be bound to make compensation for the materials that are to be lixiviated. This regulation was included in the original Resolution, which you have rejected. It has been omitted in the present, because it would impede the collection of salt-petre, and because it might give rise to an unfortunate competition between the manufacturers, who, under the pretext of bargaining for the materials *(remblais)*, would arrange the matter with the proprietors, and outbid each other. This regulation would be injurious; for the harvest of salt-petre will be diminished, if the manufacturer is obliged to pay for the substances which are to be lixiviated. Beside, this is altogether unnecessary, as it is for the interest of the manufacturers to replace them; which they seldom neglect to do.

The article that authorizes the *fouilles*,* has been particularly objected to; and the objectors have cited the efforts of the Ancient Government, made under the direction of a philosophical minister, to put an end to the constraint and vexations to which the people were exposed on this account. It is a misfortune of our climate, that the formation of nitre, among us, takes place only around our

* FOUILLE, fing. FOUILLES, pl. is a privilege granted to the manufacturers of salt-petre, to DIG UP and remove the earth of the cellars, vaults, &c. of the citizens in general, for the purpose of lixiviating it, and extracting the nitre. The great and weighty objection to the FOUILLE is, that it affords a pretext for entering private houses at all times, and exposes the inhabitants to the most tyrannical inspection, at the pleasure of those to whom this privilege is granted.

dwellings; but it is not the less necessary to collect it for our defence. The chemists have proved, that the salt which is obtained in those places, which have been hitherto subjected to the *fouille*, is nitre with an alkaline base, (nitrate of pot-ash) which scarcely needs refining; while that which is found among marble, granite, and lime-stone, is nitrate of lime, (calcarious nitre) and requires the most tedious processes to render it fit for use.—When TURGOT, in connection with the venerable LA ROCHEFOUCAULD, attempted to suppress the *fouilles*, his real object was the suppression of artificial nitre-beds. The proof of this is to be found in an Arret of the 8th of August, 1777, which ordains—That the communes that should establish artificial nitre-beds should be exempted from the *fouille;* and that private persons, who should construct similar nitre-beds, should be exempted from the poll-tax, road-tax, and militia duty. Another edict, of about the same date, ordains—That the suppression of the *fouille* should not take place till after the establishment of the artificial nitre-beds. So that it is not accurate to say that the *fouille* has been abolished; and if we take for our rule of conduct that of the former government, which has been much commended on this occasion, *we* shall not abolish the *fouille* till after the establishment of the artificial nitre-beds.—I acknowledge that it is an unpleasant and vexatious restriction; and I had much rather that it were abolished. But when it comes to be understood, that its continuance is only necessary till something better can be substituted, I see no room for hesitation.—The law must be carried into effect; and they who resist its execution must be punished.

Our colleague, PORCHER, supposes that the manufacturers, accustomed to a different mode than that proposed in the resolution, will not follow the new process of washing the salt-petre. The manufacturers themselves have answered this objection, in their replies to my Memoir—where they acknowledge, that nothing can be more simple than this process. And what demonstrates the necessity of adopting it is, that, hitherto, for want of a *certain* method of trying nitre, the government has suffered an annual loss of eighty millions of salt-petre.—The 13th article, according to the new premium, doubles that of 1790, suppresses the excess *(bonification)* of four per cent. and the delivery of pot-ash. It is a necessary consequence of the preceding; and will oblige the manufacturers to make use of ashes and other alkaline substances, whose loss will require expensive purchases. At the same time, it will increase, in France, the production or preparation of pot-ash, which we draw, at present, with great expence, from the north of Europe and America, whilst a crowd of vegetables—parasite, and even noxious plants, that infest our roads, hedges, and ditches—barks, wild fruits, and the remains of certain plants, of

which no further use can be made, might become, without injury to agriculture, (from whom we should never take more than the excess of what is requisite as manure,) inexhaustible sources of this alkali—still more useful in many other arts than in the manufactory of salt-petre.

Our colleague, IMBERT, seems terrified at the prospect of the expence which will follow the establishment of the nitre-beds. To relieve him from his apprehensions, and to shew the Council how little foundation they really have, it is incumbent on me to declare, that the greater number of the proposed establishments will require no new locations; and that those already in the possession of the administration, will not only suffice in the outset of the business, but that it will be necessary to appropriate only a small part of them to this purpose. All that is to be done is, to dig a few pits; to construct a few slight sheds, with poles, and a covering of thatch; to carry thither earths already lixiviated, the scattered and fine dirt made by pulling down old buildings, marly and chalky earths; to add to these the scum of *rafineries*,* the straw and chaff of worn-out beds, the half putrefied remains of vegetables; to moisten them with dirty liquids, such as water from the common sewers, from the sinks of kitchens, urine, and other matters of the like kind, which are of very little use for other purposes; to stir these heaps from time to time; and to lixiviate them when the salt-petre is formed. Here is nothing which requires great expence. The most material things—the situations for carrying on the business, as well as the utensils,—exist already. The substances which produce the acid and become nitrified will require no further trouble than to collect, heap them up, and stir them. The workmen employed in refining nitre and manufacturing gun-powder, will suffice; or, at most, a very small number only will be requisite for the additional labour of these establishments.

Nitrification was long a mystery to chemists, before they learnt how to seize upon, distinguish, and fix those fugitive and volatile substances, known at present by the name of elastic fluids, or gases. The acid which enters into the composition of nitre, and which is formed by the combination of two of these fluids, was entirely unknown, and its formation still presented to the learned an inexplicable problem. The immortal discoveries of Cavendish, of Priestley, of Lavoisier, and of Berthollet, have taught us that this acid is composed of the same elements with atmospheric air, only under a different form, and in different proportions than those which constitute the atmosphere.

* The ordinary signification of this word is sugar-houses; but it may be used here to denote the houses for refining of nitre.

These facts are indisputably established by experiments, in which the nitric acid is decomposed, and again produced by the union of the original elements. Hence it is demonstrated that it consists of four parts of oxygene, and one of azote. But these two principles, as contributing to the formation of the atmosphere, are in the proportion of a little more than two parts and a half of the first, and one part of the second; and exist in an uncombined state, separately dissolved in a common menstruum, and without the possibility of contracting a real chemical union. Hence it arises, that atmospheric air is never spontaneously converted into nitric acid; and that, after augmenting the proportion of oxygene gas, if the electric spark is passed through this new mixture, a few cubic inches only are acidified, in the delicate experiments known and verified by the greater part of the natural philosophers of Europe. But this acidification, to which the beneficence of nature has placed an insurmountable obstacle, in the atmosphere, (which ought always to maintain the equilibrium of its composition, for the preservation and continuance of vegetable and animal life,) takes place, always, when substances, into whose composition azote enters, are exposed to a stagnant air, that envelopes and penetrates them. Then, in proportion as the azote, freed from the bonds of its primitive connection, tends to disengage itself, and assume the nascent state of an elastic fluid, it gradually unites with the oxygene of the atmosphere, which it absorbs with avidity, and forms the nitric acid, as soon as one part of the former of these principles is associated with four parts of the latter.

It is in this manner that vegetable and animal substances that contain a large quantity of azote in their intimate combination, and which is slowly disengaged in consequence of their spontaneous decomposition, produce the nitric acid whenever, after having been slightly moistened, they rot in an atmosphere but little agitated. It is thus that the earth of stables, studs, folds, barns, vaults, and cellars, impregnated with liquors, fragments of viands, or the humid dust of vegetables and animals, acquires, after a certain period, that acid which it did not originally possess. Farther, it is by this means that this very earth or soil, taken out of the vaults which contain it, and which are often very imperfectly ventilated, and exposed to a free air, becomes more enriched with the acid, in a few days, than it would have been in some months, without atmospherical contact. Finally, it is by the operation of the same natural cause that the soft calcareous stones that are dug up in the fine countries, bathed by the Indre and the Loire,—materials naturally abounding with one of the elements of the nitric acid, without containing an atom of it while they are buried under the soil,—become impregnated with it, with a readiness and abundance equally astonishing, when exposed to the

air. And these important truths, of which the world was wholly ignorant till within the last fifteen years, have been incontestibly demonstrated by the ablest philosophers and the most learned and illustrious chemists of Europe. The researches and celebrated experiments by which this beautiful theory has been developed, are contained in the memoirs and works of Cavendish, Priestley, Lavoisier, Berthollet, Kirwan, Van Mons, Chaptal, Gren, and Scherer, all men upon whose discoveries and labours Europe and the whole learned world have now their eyes fixed, and whose names will never be pronounced by a grateful posterity but with respect and a tender remembrance of the benefits derived from their exertions.

But it is not sufficient to comprehend, how perfectly soever, the formation of the nitric acid. For, after all, this acid constitutes but the one half of nitre or salt-petre. If, in proportion as it forms, it does not find a base capable of absorbing it, an alkali able to retain and confine it, it flies off, and is dissipated in the air.

Nitre results from the saturated union of the nitric acid and a fixed alkali, called pot-ash, in nearly equal parts. This species of alkali is abundantly found in vegetables; and it is on this account that the salt-petre which is extracted from caves, cellars, coach-houses, and barns, is purer and richer than that which is extracted from nitrified stones, the ruins of walls and plaister. Those departments, so fertile in nitrous salts, of which I spoke but a moment since;—those countries, bathed and encircled by the Loire, the Indre, and the Mayenne; those cantons of whom Saumur has long been the center, and whose name SALMURIUM, *sel de mur, sel de muraille*, discovers the ancient manner of abundantly extracting salt-petre, furnish us only with calcarious nitre, or the union of the nitric acid and lime; because the lime-stone, which becomes nitrified in the air, contains no alkali; so that, to obtain real nitre, a salt which will not *give* in the air, and which will answer in the fabrication of gun-powder, we are obliged to decompose this earthy salt, this natural mother-water, to precipitate the lime, and substitute the alkali. This requires the consumption of a large quantity of pot-ash, and ought to convince the administration that, to carry the production of the salt-petre of these rich central departments to the height which it ought to attain, it is necessary to create and render domestic the art of making salt and pot-ash, as has been attempted with some promise of success. It has been already shewn why, and in what manner, the liquid, or moistened solid, remains of vegetables and animals, mixed with light calcarious and marly earths, suffered to putrefy, in a sheltered place, where the air slowly circulates, whose surface is occasionally changed, and which contains, at the same time, one of the con-

stituent elements of the nitric acid, and the alkaline base with which this acid unites to form nitre, produce this salt by absorbing one of its most abundant principles, or three fourths of its weight, from the atmosphere.

It must be confessed that this art, founded on a theory as simple as perspicuous, can oblige nature to produce salt-petre, by uniting, under suitable circumstances and conditions, the materials which enter into its composition; and favouring their combination by processes resembling those which nature herself employs, the secret of which we have at length discovered. For it is no longer to be doubted that the salt-petre which forms itself, under our eyes, in soils soaked by vegetable and animal juices, or in stones impregnated with the same juices or their vapour, (the materials which compose the floors and the walls of our stables, folds, vaults, coach-houses, &c.) represent in this respect, real artificial nitre-beds: to imitate whose proportions and processes is all that we aim after. And this is what the latest and most precise data on the formation of nitre-beds would induce us to do, for the erection of these establishments, almost without expence and original cost. "Without the apparatus of extensive artificial nitre-beds," (says one of our most celebrated and most useful French chemists, citizen BERTHOLLET, in one of his excellent lessons at the Normal School)—"an immense quantity of salt-petre may be pro-"cured, through the whole extent of the Republic; if the strata of "earth which are to be found under the dung-hills of sheds and "stables were to be collected from time to time; if the substances "that have been already lixiviated were substituted in their place; if "this earth were then mixed with remains of vegetables; if this "mixture were moistened with the waters collecting occasionally "on the surfaces of dung-heaps then, by proceeding to lixiviation "and evaporation, a succession of operations might be established "equally beneficial to the national interest, and that of individuals."

In short, if any thing further be required to demonstrate, that the success of artificial nitre-beds is certain, we may cite the example of those which have been established in Sweden, in Prussia, in the Canton of Appenzel, at Malta, in China, and in India: that of Dijon, for which we are indebted to the exertions of our fellow-citizen GUITON-MORVEAU, already produces 15 millions of salt-petre annually; that of Auxerre, 10 millions; and those of Caën, of Chalons-sur-marne, and Troyes, afford results equally satisfactory.

REVIEW.

[☞ *Under this title it is intended to include a review not only of late medical publications, strictly so called, but also of all such publications concerning agriculture, and other branches of natural history, natural philosophy, &c. as may in any wise relate to the objects contemplated in the plan of the Medical Repository.*]

ART. I. *Medical Inquiries and Observations:* Containing an Account of the bilious remitting and intermitting Yellow Fever, as it appeared in *Philadelphia*, in the year 1794; together with an Inquiry into the proximate Cause of Fever; and a Defence of Blood-letting, as a Remedy for certain Diseases. By *Benjamin Rush*, M. D. Professor of the Institutes, and of Clinical Medicine, in the University of Pennsylvania. 8vo. pp. 258. *Dobson.* Philadelphia. 1796.

THE present work may be considered as the sequel of a former, on a similar subject, which the public has received from the same author. It should serve to alleviate our recollection of the ravages occasioned by the disease here treated of, to observe, that we owe to this cause an increased zeal for medical inquiry, much various disquisition of importance, and several publications likely to produce lasting benefit to the science of medicine. To derive improvement from calamity, and thereby to convert misfortunes into blessings, is a mode of exertion, in which active and enterprizing minds have been often engaged with much success. It requires promptitude, freedom, and boldness of thinking, and the wide range of a mind, unawed by authority, and unfettered by the shackles of a preconceived system.

The disease which produced the present, and the former work, was, in several respects, most remarkable. Relinquishing the tameness of common forms, and the blended and insidious colouring, which often, in our observation of epidemics, tend to perplex and confound; it assumed a definite and striking character, not only calculated to disclose its own nature, but also to throw light on the general doctrines of diseases. The author has availed himself of this advantage with great ability. Perceiving at an early period of the epidemic, that the moment of important observation was arrived, and that nature might then be subjected to a close inspection and decomposition of her morbid operations, he

watched, and scrutinized, and penetrated, with a degree of ardour, assiduity, and success, which do him great honour. And we find ourselves at a loss which most to admire, the humanity that impelled him to such labours, or the force of mind, and felicity of investigation, which conducted him in his researches on this subject.

This work, as is indicated by the title page, consists of three principal parts. The first contains "An Account of the bilious remitting and intermitting Yellow Fever, as it appeared in Philadelphia, in the year 1794." And this, therefore, comes in the first place under our consideration.

Dr. Rush begins by remarking, that the fatal epidemic of 1793 was succeeded by diseases of a highly inflammatory nature. The same disposition was continued throughout the spring of 1794. Intermittents were more obstinate than common, and yielded not to the largest doses of Peruvian bark; and, in one case, an internal dropsy of the brain, produced by that remedy, could only be overcome by blood-letting and other evacuations.

From the inflammatory complexion of the diseases of the winter and spring, our author expected to find the fevers of the summer and autumn of a violent and malignant nature. This opinion was strengthened by observing the filth, allowed to accumulate in the gutters of the city, and inattention to other important objects of police.

Early in June, appearances of the Yellow Fever were observed; and during the remainder of that month, several cases occurred to Doctor Rush himself, displaying the unequivocal character of the disease, and attended with considerable degrees of violence. In the course also of this month, many cases of swelled testicles, succeeding slight attacks of fever, took place, not dissimilar to instances of swelled testicles, recorded by Doctor Desportes, in an account of the Yellow Fever which prevailed at St. Domingo, in the year 1741.

In July and August, the disease shewed a disposition to spread still more. It often appeared disguised under the forms of cholic, pneumony, and hemorrhagy. The cholera infantum was common during these months; and was more obstinate and fatal than usual.

From the influence of occasional showers of rain, in the months of September and October, the disease was frequently checked. It was observed, however, that while showers of rain checked it, moist or damp weather, without rain, favoured its propagation. The cold weather in October restrained, but did not extinguish the fever. It appeared in November, and in all the succeeding winter and spring months; owing probably to the mildness of the weather in those seasons.

The causes, which predisposed to this fever, were the same as

in the year 1793. Persons of full habits, strangers and negroes were most subject to it.

Summer fruits, improperly used, terror and vexation, were sometimes observed to act as exciting causes of this disease.

Two premonitory symptoms struck the author this year which had not been observed in 1793. A frequent discharge of pale urine for a day or two before the commencement of the Fever—and sleep unusually sound the night preceding the attack. The former symptom was a precursor of the plague of Bassora, in the year 1773.

In the arrangement of the symptoms of this fever, the author follows the order adopted in his account of the Yellow Fever of 1793, and describes them as they appeared in the sanguiferous system—the liver, lungs and brain—the alimentary canal—the secretions and excretions—the nervous system—the senses and appetites—upon the skin, and in the blood. This detail of symptoms is delivered with great precision and accuracy, and certainly forms a very interesting part of the history of the disease; but as it does not materially differ from the account of the disease in 1793, our limits do not permit us to enter into particulars on this point.

The forms in which this fever appeared were the following—a tertian, most frequently a remittent, with evening exacerbations—it assumed, in several instances, the symptoms of cholic, cholera, and dysentery—once it appeared in the form of apoplexy—it was disguised in the form of madness—late in the season it was accompanied with symptoms of pleurisy—it attached itself to puerperal fever—even dropsies partook of its character—it blended itself with scarlatina, measles, small-pox, gout, &c.

The predominance of this disease, and of powerful epidemics in general, over other diseases, is strenuously maintained by the author. His former proofs on this head are reinforced by some additional instances, and illustrated by further reasoning.

This fever was contagious in very few instances, compared with that of the preceding year. The contagious quality was by no means confined to the most malignant degrees of the disease. And in many cases, where fever was not excited, peculiar effects of the contagion were discoverable in different parts of the body.

The common modes of preventing the action of contagion on the system, during this epidemic, as well as that of 1793, not only failed, but probably favoured the spreading of the disease. Temperance, a vegetable diet, with such addition of aromatics as may be necessary to preserve the tone of the stomach and bowels, and occasionally gentle doses of physic, seem to be best calculated for this purpose. The effects of smoke in destroying contagion are particularly commended.

From the means of securing individuals from contagion, Doctor

Rush passes on to give directions for preventing its admission and propagation in cities. To accomplish this, he would have physicians compelled to disclose the existence of contagious fevers—if imported, that the importing vessel be removed to a proper distance, and purified—if of domestic origin, that the putrid sources of exhalation be destroyed—and meanwhile, that all the families within fifty yards of the infected person or persons, be ordered instantly to remove into houses or tents, provided at the public expence, and that all access to the sick be denied, except by physicians and nurses.

The author, notwithstanding these directions for arresting the progress of contagion, is far from admitting, that a contagious disposition is one of the characteristic marks of this disease. On the contrary, he contends, it is accidental, depending on circumstances of different seasons, countries, &c.

The origin of this fever, in the next place, claims attention. It is asserted to have been evidently produced by exhalations from the gutters, and the stagnant ponds of water in the neighbourhood of the city. Where there was most exhalation, there were most persons affected by the fever.

What the exact state of the atmosphere is, which disposes to malignant fevers, Doctor Rush supposes to be difficult to determine. Two things with respect to it are obvious—it pervades, at the same time, a great extent of country—and it continues, for several years, under all the circumstances of wet and dry, of hot and cold weather. This morbid peculiarity is suspected by our author to be the effect of a preternatural quantity of the oxygenous portion of the atmosphere.

With much of the caution and diffidence which become a philosopher, in treating a subject not yet satisfactorily developed, Dr. Rush offers this conjecture. As this is a subject on which different opinions are held, and as it is probable many persons may not consider our author's arguments on this point as conclusive, it will not be deemed improper to state some of the objections which lie in the way of his hypothesis.

1. This opinion seems to derive no support from eudiometrical experiments, nor any other direct proof hitherto laid before the public.

2. It seems to be rendered improbable by the season of the year, when these malignant fevers are most apt to prevail; that is, the latter end of the summer and the autumn. If any material variation, as to the relative quantity of oxygene air, at different seasons, should hereafter be found to take place, it would seem probable that it is most scanty in the season just mentioned. A considerable proportion of vegetable substances is then dead; and even the living vegetables, a principal source of that air, have, at that

time, much declined from the fresh vigorous and healthy state in which they emit the most copious supplies of it.

3. That a greater proportion of oxygene air exists in the atmosphere in the winter, spring, and early part of the summer, than during the remainder of the year, seems to be rendered probable by the brighter and more florid complexion of people generally at such seasons, and by the nature of the diseases then most apt to prevail. And, in further confirmation of this, it may be observed, that during the usual epidemic season of these malignant fevers, paleness and sallowness of complexion are commonly found to predominate.

4. If an increased proportion of oxygenous air predispose to malignant fevers, it would scarcely seem probable, that the atmosphere of the country should so generally resist the spreading of that contagion as experience testifies.

5. No uniform, general, or even frequent appearances, in the circumstances of blood-letting, seem to warrant this opinion.

6. Our author himself recommends *vegetable* diet, as one of the best preventives of malignant fevers; and orders *acidulated drinks* in the course of the disease. It is difficult to imagine how the acknowledged usefulness of this diet, and these drinks, can consist with a predisposing prevalence of the oxygenous principle in the atmosphere.

7. The late experiments of Dr. Carmichael Smith appear to militate against this opinion. The fumes, produced according to his directions, to destroy contagion, consist, as Mr. Keir asserts, of highly oxygenated nitrous vapour, mixed with a large quantity of pure oxygene air.

The specific nature of the exhalations which induce these diseases, our author declines to decide. Besides their effects on the human system, he mentions several instances of their violent operation on domestic animals, and particularly on cattle, fed upon marshy pasture in autumn.

Dr. Rush proceeds, in the next place, to deliver an account of the method of cure. The remedies used in this fever were the same he had employed the year before. And the treatment consisted,

1. In the abstraction of the stimulus of blood and heat from the whole body, and of bile, and other acrid humours, from the bowels, by means of the following remedies: Bleeding, purging, cool air, and drinks—cold water applied to the external parts of the body, and to the bowels by means of glysters.

2. In creating a diversion of congestion, inflammation, and serous effusion, from the brain and viscera to the mouth, by means of a salivation, and to the external parts of the body, by means of blisters.

3. In restoring the strength of the system, by tonic remedies.

Under the head of bleeding, the author observes that this fever differed from that of 1793, in coming forward, early in the season, with a number of paroxysms, which refused to yield to purging alone. He, therefore, began the cure of every case he was called to by bleeding. And it is only by contemplating the extent in which it is necessary to use this remedy, in order to overcome a yellow fever, that we can acquire just ideas of its force.

On the subject of purging, but little is added to the observations made upon that remedy in the year 1793. Jalap, calomel, and gamboge were used until large and dark-coloured stools were obtained; after which the bowels were kept gently open every day with castor oil, cream of tartar, or Glaubers' salts. Calomel was given in much larger quantities than in the preceding year.

Cool air and cool drinks, cleanliness, cold water applied to the external parts of the body, and injected into the bowels by way of glyster, did great service. Pains of the head, and of the bowels, were relieved by cloths, dipped in cold water, and applied to those parts. The coldness of pump water, when used in this way in 1795, was increased by dissolving ice in it, and, in some cases, powdered ice was applied in a bladder to the head with great advantage.

Salivation was excited, as early as possible, in all those cases which did not immediately yield to bleeding and purging. It were greatly to be wished that the use of this remedy should be rendered universal in the treatment of malignant fevers.

Blisters, when applied at a proper time, did much service. This time was, when the force of the fever was so far reduced by evacuations, that the stimulus of blisters sufficed to carry off the remainder of the disease.

After the reduction of the morbid action of the blood-vessels, by the remedies mentioned, Dr. Rush seldom made use of any other tonic than a nourishing and gently stimulating diet. This consisted of summer fruits, bread and milk, chicken broth, the white meats, eggs, oysters, and malt liquors, more especially porter.

Peruvian bark was commonly found ineffectual, and in many cases manifestly hurtful in this disease. Columbo root, the Carribean bark, and other bitters were attempted to be substituted for it, but without success.

Wine was hurtful in every case of Yellow Fever, in which it was given while there were any remains of inflammatory action in the system.

Opium was observed to be less injurious in this fever, than in that of 1793.—Nitre and antimonials were offensive to the stomach, and altogether useless.

With these observations our author concludes the history of the symptoms, origin, and cure of the Yellow Fever, as it appeared in Philadelphia in 1794, and in the winter of 1795.

We exceedingly regret, that it is not in our power, consistently with our limits, to give a more detailed account of this part of our author's work. A great number of his proofs and illustrations, very material to a due understanding of his opinions, are unavoidably passed without notice. For a satisfactory view of these, we must refer the reader to the work itself.

The additional proofs of the domestic origin of the Yellow Fever, here adduced, together with occurrences, which have taken place in other parts of the United States, must, we apprehend, have long since removed every doubt on this question.

The mode of treatment, adopted by our author, was, in an eminent degree, simple and energetic; and, notwithstanding every inference that can be drawn from a few unfavourable cases, was singularly successful.

[*To be continued.*]

ART. II. *A Memoir concerning the Fascinating Faculty which has been ascribed to the Rattle-snake, and other American Serpents.* By *Benjamin Smith Barton*, M. D. &c. Philadelphia. *Sweitzer.* 8vo. pp. 70. 1796.

IT appears from the preface to this Memoir, which is inscribed to the late amiable and ingenious Dr. Rittenhouse, that it was originally read in the American Philosophical Society, and is expected to form a part of the next volume of its Transactions. Dr. Barton assigns as reasons for a separate publication, a desire of "distributi..g it among his friends, and those who are curious "of researches in natural history." He also informs us, that the Memoir in question has received considerable additions, since its first reading.

Our readers are well informed of the various opinions which are entertained on the subject of the paper before us; of the contradictory explanations which have been offered; and of the doubts which have been entertained of the reality of the fact termed Fascination. We shall detain them, therefore, no longer from the Memoir; from which they may naturally expect to derive entertainment, judging from the author's well-known ingenuity in this kind of investigation.

The Dr. commences his inquiry into the nature of Fascination, and the reality of the Fascinating Faculty, by remarks on the extent of the conviction of its truth,—which he does not hesitate to

call a prejudice;—and by a description, chiefly after Professor KALM, of the manner in which the supposed fascination is effected. As there is nothing new or peculiar in this description, it is unnecessary to lay it before the reader. The author, next, examines into the origin of this belief, or prejudice. He finds no traces of it in the writings of the Ancients, which have been subjected to his inspection. He even questions the correctness of the opinion of Dr. Cotton Mather and Mr. Dudley, that it originated among the Indians of North-America. He observes that this belief is by no means *now* prevalent among our Aborigines; and that the veneration accorded to the rattle-snake, by some tribes, may, with great probability, be ascribed to a superstitious fear of its power to injure them—founded on their religious notions. Finally, on this point, he remarks, that there is no evidence of the existence of this prejudice among the native Indians of South-America.

From this fruitless attempt to discover the native country of the opinion which he combats, Dr. Barton enters into an enumeration of the principal authors who have supported, or have doubted of its validity. Linnæus, Gmelin, Kalm, Dr. Samuel Johnson, Mr. Bartram of Philadelphia, &c. are ranged in its favour; Dr. J. E. Smith and Mr. Pennant appear to entertain suspicions of its truth. But a much larger portion of the Memoir is devoted to an examination of two distinct explanations, of fascination, offered by M. de la Cépede, in his "Histoire Naturelle de Serpens;" whose words Dr. Barton quotes at length. The first solution of M. de la Cépede is, that what is called fascination is effected by *the pestilential breath of the serpent, or by noxious effluvia exhaling from his body.* In opposition to this idea, Dr. Barton affirms, that persons have taken the head of the black, and other snakes, into their mouths, without injury, and without perceiving any bad smell; that he has been present when a small box, in which a number of serpents had been confined, was opened in a small, warm room, without being sensible to any peculiarly offensive odour; and that a gentleman of his acquaintance, who has long had a rattle-snake under his immediate care, has never observed any disagreeable vapour to proceed from it.* Not-

* In some parts of the United States it is not uncommon for persons to fasten the live rattle-snake to the earth, (by means of crotched sticks at the head and tail,) and then to bite this reptile, through the back, from one extremity to the other. This is done from a persuasion that those who perform this strange act will thereby secure themselves from all pain and decay of the teeth. The snake is supposed to bear off every thing which tends to promote disease in the teeth. The writer of this article has seen two persons, and one of them a physician, who, when boys, had made the experiment. Were the effluvia of the serpent very noxious, this attempt would, probably, have proved fatal.

withstanding, our author acknowledges that the testimony of men of indisputable veracity leaves him no room to doubt but that an odour, exceedingly unpleasant, does emanate from this and some other species of serpents. But, observes our author, birds have been inclosed, with these serpents, in the same cage, without suffering any inconvenience; and birds are often known to sit over their eggs, hatch, and rear their young, on the branches of bushes at whose roots the rattle-snake lay. This serpent, too, is often preyed upon by the eagle, the hawk, and other birds, without their, or their young, suffering any injury in consequence. The first explanation, therefore, of M. de la Cépède is not admissible.

The reasons assigned by Dr. Barton for rejecting this solution of the Continuator of Buffon, are of various importance. No great evidence seems derivable, on either hand, from the fact of the presence, or absence, of fœtid emanations. The most offensive odours are often harmless, so far as the health of those exposed to them is regarded; and the most subtle poisons are frequently destitute of any peculiar pungency of smell. But if Dr. Barton have displayed no remarkable ingenuity in this part of his Memoir, it may be observed that no great strength of argument appears requisite to refute so improbable a suggestion as that of M. de la Cépède.

The second explanation proposed by the French Naturalist is, that, *in cases of supposed fascination, the birds and other animals, thought to be fascinated, have been previously bitten by the serpent; and that their cries, efforts, and apparent agonies, are the effects of the poison:* and such appears to have been the opinion of Sir Hans Sloane, and of the author of the article in the Monthly Review, which contains an account of M de la Cépède's work. But Dr. Barton rejects this solution equally with the other. He observes, in the first place, that the effects attributed to fascination bear no resemblance to those known to be produced by the poison of the rattle-snake—for a description of which he refers to a paper inserted by him in the third volume of the Society's Transactions;—and he dwells with emphasis on the well-established fact of the animal's having often survived, after having been subjected to fascination, when the serpent had been seasonably frightened away. In the second place, the Doctor remarks, that the fascinating faculty is by no means confined to the rattle-snake, but is predicated of various other serpents, particularly the black-snake, who are known not to be venomous. M. de la Cépede's second explanation is, therefore, alike insufficient with the first.

This argument, we confess, appears to us conclusive; and two

facts which will come to be stated, in the course of this article, add strong confirmation to its truth.

The last opinion examined by Dr. Barton, is that of Professor Blumenbach, of Göttingen, who ascribes the power attributed to the rattle-snake, *to his stedfast looks, and to the hissing noise of his rattles, by which he entices the birds, &c. to follow him:* and the Professor observes, that this last circumstance is perfectly analogous to the practice of the Indians, who, by imitating the noise made by this serpent, allure and take squirrels.

In reply to this, Dr. Barton remarks, 1. That serpents unprovided with rattles, are equally successful as the rattle-snake: 2. That, from good information, he has reason to believe, that this serpent does not always shake his rattles, in the act of charming; and 3. That M. Blumenbach has probably mistaken the artifice of the savages, to which he alludes, for their practice of imitating the cries of young birds, and by that means enticing the parents within reach of their arrows.

Having thus carefully examined the opinions of his predecessors in this inquiry, Dr. Barton now proceeds to state his own opinion, together with the facts on which it is founded. We shall follow his arrangement as nearly as will consist with the limits of this part of our work, and without neglecting the justice due to the author.

Before any decisive judgment should be hazarded on the subject, Dr. Barton informs us, he deemed it necessary to ascertain—"First, what species of birds are most frequently observed to be "enchanted by the serpents; and, secondly, at what season of "the year has any particular species been most commonly seen "under this wonderful influence." The result of his investigation and observation, with relation to these points, is—

1. That all the birds, said to be fascinated by the rattle-snake, build on or near the ground.

2. That the season when fascination is agreed to be most common, is that in which the birds lay, sit, and hatch.

3. That the rattle-snake is a slugglish reptile, and unable to climb to any height; but that the black-snake is able to glide up the highest trees, and is often seen to mount their tops, when impelled by hunger, in search of prey.

4. That the principal food of the rattle-snake is the *Great-frog** of our rivers, creeks, &c. On dissecting many of this species of serpent, no other animal has been found in its stomach, save in one or two instances; and then the animals were such as dwelt on the ground.

5. That the black-snake chiefly preys on birds; his superior activity enabling him to assail the nests, in the absence of the parent bird, and destroy the eggs, or bear off the young.

* Rana ocellata of Linnæus.

These facts being established, the inquiry naturally recurs, for what end were the serpents endued with the fascinating faculty? The uniform reply, Dr. Barton remarks, is—to obtain their food.—In shewing this supposed power to be unnecessary, or unemployed, for this purpose, the Doctor derives a new argument against its existence. For, according to him, the rattle-snake only preys on animals within his reach, to take whom he has no need of the fascinating faculty; while the black-snake exerts himself in a surprizing manner to catch a prey that might be easily entrapped were he able to charm it—and Dr. Barton relates (p. 67.) a very striking fact, to prove the labour and art of this serpent, to satisfy his hunger.

Having shewn that the serpents, said to be possest of the fascinating faculty, do not employ it for the only purpose for which it can rationally be supposed to have been conferred on them, all that remains for Dr. Barton is, to explain the effects which have been attributed to this power in a more satisfactory and rational manner. This he endeavours to do, by referring the cries, efforts, &c. of the animals said to be under the influence of fascination, to their anxiety, courage, and exertions, for the protection of their young. On this topic, the Doctor enlarges with much ingenuity; and we regret that we cannot extract the whole of his interesting argument. When the nest, or the young, are assailed by the serpent, Dr. Barton supposes the parent bird to attack him "with her wing, "her beak, or her claws." This is successful, and the reptile is killed, or obliged to fly; or it is unsuccessful; and he first consumes the offspring, and then the wearied and agitated parent. Dr. Barton concludes this part of his argument by relating a fact, communicated to him by Mr. Rittenhouse, which is corroborative of this explanation.

THE reasons assigned, by the author of the Memoir just noticed, for discrediting the existence of the Fascinating Faculty ascribed to serpents, are for the most part satisfactory; and the explanation given by him of the effects attributed to this supposed faculty is, probably, many times just. But, as in all doubtful cases, there is a propriety for every suggestion which may lead to greater certainty, we shall make no apology for proposing, in this place, two additional solutions of the problem before us. We are willing to believe that what is called fascination may, at different times, be attributable to the cause assigned by Dr. Barton, and to each of those which we shall now suggest. The various animals subjected to this pretended power, and the various effects it is described as producing, sufficiently countenance the conjecture.

I. The *cat-bird* is enumerated among those birds that are preyed on by snakes, by means of the fascinating faculty. The artifices of this bird are known to every person conversant with the birds of this country. In the season of rearing her young, if started by a man, she flies along before, with every appearance of concern; agitating her body; frequently alighting; and uttering the most distressful cries. By this means she eludes the search of those who are hunting for her nest. The pursuer is induced to believe it at every place where she alights; and is thus, constantly, led farther and farther from its real situation.—Nor is this artifice peculiar to the cat-bird. Every school-boy has been made the dupe in this way, of many of those birds who nest on, or near the ground.

Is not this the probable history of many instances of supposed fascination? The agitation and cries of the bird are its artifices to mislead the serpent, who is looking for her young. In those instances where the snake discovers them, the artifice proves useless, and the mother may, according to Dr. Barton's explanation, fall a victim to her efforts in their behalf. In other cases, the snake is either drawn away by the deception, or, being frightened from his purpose, *the bird flies off, uninjured by the supposed fascination.*

II. Another supposition which has occurred to us, and which is countenanced by a number of facts, is, that *in those cases where birds, or other animals have died, without any external injury from the snake, they have expired in a paroxysm of fear.*

This conjecture derives no inconsiderable support from the whole conduct of birds, while under the influence of fascination, as described by the advocates for this inconceivable faculty.

On this supposition, there is no difficulty in accounting for the facts related of animals dropping down, suddenly, into the very mouths of the charmers.

The facts stated by Mr. Vosmaër, and mentioned by Dr. Barton, (p. 34 of his Memoir) are in point; as seems, in part, admitted by the Doctor himself. Nor are the experiments made in Philadelphia less in favour of this explanation. The operation of terror will be different, according to its degree. Some animals, and there have been instances among the human species, expire immediately, under its powerful influence. Others, it affects with a temporary torpor. Others, again, it provokes to actions the least favourable to their own designs; and they precipitate themselves into the very danger they would avoid. Some, it furnishes with unusual powers of flight: and some, it arms with all the courage of despair. Indeed, the varieties in the operation of the fabulous charming power of serpents, are not so numerous but that they admit of perfect explanation, on the idea now suggested. Nor will a solitary instance of unconcern in a bird exposed to a serpent

(see Memoir, p. 36.) be sufficient to invalidate the probability of its correctness. Two very curious facts may be added, in support of this conjecture, which, as it appears to us, are not easily to be explained on any other hypothesis. We quote them from the account of "Le Vaillant's Second Journey into the Interior of Africa," given in the Appendix to the xxth vol. of The Monthly Review Enlarged, art. vii. pp. 526, 27. The passage referred to is, in the words of the translator, as follows.

"Casting my eyes on the trees, I perceived a motion in the "branches of that which was nearest us. We presently heard the "piercing cries of a butcher-bird, which was struggling in con- "vulsions. Our first idea was that it lay under the talons of some "bird of prey: but, on surveying it more attentively, we were "surprized to see, on the next branch, a very large serpent, "which, totally immoveable, but prepared to strike, and with in- "flamed eyes, fixed the poor animal. The bird agitated itself, "and struggled in a frightful manner; but fear had taken away all "its powers; and, as if held by the feet, it seemed to have lost the "faculty of flying away. One of us went for a gun: but, before "he returned, the bird was dead, and he shot only the serpent. "I then caused the distance between the two creatures to be mea- "sured, and found that it was three feet and a half; so that all the "company were convinced that the bird could not have perished "by the bite of the serpent. I plucked the bird in their presence, "and made them all remark that it was entire, and had not the "least wound.

"A similar adventure had before occurred to me, in the Canton "of Twenty-four Rivers, which I now related to my companions, "in order to confirm what they had just seen. One day, as I "was shooting in a morass, I heard, on a sudden, very shrill and "painful cries issue from a tuft of reeds. Curious to know the "cause, I approached gently, and saw a little *mouse*, which, like "the butcher-bird, was in a convulsive agony; and two paces "farther, I perceived a serpent looking intently on it. As soon "as the reptile perceived me, he skulked away: but the effect of "his presence had already taken place. Having caught the mouse, "it expired in my hand, without my being able, on the most at- "tentive examination, to discover the actual cause of its death."

We recommend these facts, which would add some plausibility to the idea of Professor Blumenbach, (that fascination is in part effected by the stedfast looks of the serpent,) to the attention of Dr. Barton; and leave our readers to form their own conclusions.

THAT we may not take leave of this subject without some practical advantage to the reader, we shall request his patience, if

we extend this Article to a purpose not altogether disconnected with the question just examined.

Whatever may be true of birds and other small animals, the human species, notwithstanding some ridiculous tales, seem to be in little danger from the fascinating power of serpents. Unfortunately, they are not equally exempt from danger, from the poison of these reptiles. Various vegetable substances are extolled for the cure of the bite of the rattle-snake; but we know not with what reason. It will be some compensation to those who have attended us through the preceding analysis and conjectures, if we shall be able to point out to them a certain and convenient remedy against the venom of this serpent. And such an one we hope is discovered: though we cannot pronounce with certainty till the experiment has been tried.

In a valuable collection of papers, intitled—"Dissertations and Miscellaneous Pieces relating to the History and Antiquities, the Arts, Sciences, and Literature of Asia," by Sir William Jones and others, vol. ii. p. 222, there is an interesting paper "On the cure of persons bitten by snakes, by John Williams, Esq."—The paper consists of the history of seven cases of persons bitten by snakes, with remarks. These, the author affirms, were selected by him, from a number of similar cases, in which his remedy had proved equally successful. Most of the instances here related, are of bites by a serpent which Mr. Williams calls the *Cobra de Capello;* but he assures us that the means he employs are alike efficacious in the cure of the bite of other serpents.

The operation of the poison of the East-India serpents is very rapid. In a few minutes, those who are bitten are affected with pain, giddiness, stupor, convulsions—particularly of the jaws, and a profuse discharge of saliva. The affections of the throat, the author remarks, are constant symptoms of the poison of the *Cobra de Capello.*

The cure consists in the immediate application of a ligature around the limb bitten, so as to prevent the return of the venous blood to the heart; in washing the wound with *Volatile Caustic Alkaline Spirit;* and in the repeated administration of the same medicine, in doses of from 30 to 60 drops, in water, every five, eight, or ten minutes, till the patient is completely relieved.

The author lays some stress on the use of the ligature; yet it is probable that he is mistaken in supposing the poison to be transmitted by the veins; and it may be remarked, that the ligature was applied in but two of the seven cases he has recorded.*

* The abſorption of the poiſon can only take place by the lymphatics. If compreſſion anſwer any good purpoſe, it muſt be by impeding circulation in them. They tranſmit the venom to the heart; and it muſt be through their agency that the changes ſaid to be wrought in the blood, by the poiſon of ſerpents,

Though the medicine is directed to be administered immediately, yet one instance occurs of its obviating the effects of a bite, which had been inflicted more than an hour. And Mr. Williams declares, that he never knew it fail, if the patients were able to swallow it.—Relief is generally given in a few minutes; and most of the cures are completed within a few hours—some in half an hour.

It is not essential to use the *Volatile Caustic Alkali Spirit;* tho' it is to be preferred, as the dose is more easily ascertained. Where it is not to be had, *Spirits of Hartshorn*, of *Sal Ammoniac*, &c. may be employed; increasing the dose in proportion. One of the cures, related by Mr. Williams, was made by *Eau de Luce.*

The uniform success of this medicine—the Volatile Alkali—in the cure of the bite of Asiatic serpents, and the probable analogy between all animal poisons, induce us to recommend a trial of the remedy to our country practitioners, on the first occasion. We shall be gratified to receive communications on this subject; and still more gratified if they convey to us assurances of the efficacy of the remedy proposed.*

Another important inquiry, suggested by the paper we have just mentioned, is—as the *Volatile Alkali* is so successful in the cure of those who are poisoned by the bites of serpents; as the inseperable symptoms of the venom of the *Cobra de Capello* bear a striking resemblance to those which accompany the disease known by the name of *Hydrophobia*—viz. spasms of the glottis, locked-jaw, and a profuse discharge of saliva; and as the Hydrophobia also, at least in some instances, appears to be of animal origin; may *it* not likewise be found a useful remedy in cases of Canine Madness?—The idea seems not altogether unworthy of attention. Hitherto we have discovered very little of the nature of this disease, or of the manner in which animal and other poisons affect the system. In this uncertainty the most improbable suggestion may have its use. The least glimpse of probable benefit from any medicine, in this case, deserves notice; and future experience may prove Ammoniac to be a valuable remedy in the numerous diseases which arise from chemical injury to the constitution.

are produced. The unexpected length of this article forbids our enlarging on this subject.

* The success of the VOLATILE ALKALI in the cure of the bite of the Viper, is a further inducement to make trial of it, in cases of the bite of the rattle-snake. The reader, who is curious for further information on this point, may consult "Dictionaire raisonné universel d'Historie Naturelle"—par M. Valmont de Bomare, tome ix. p. 352; where, with much other valuable information, he will find a circumstantial narration of an instance of the curative effects of this salt, in destroying the poison of the Viper.

ART. III. *Medico-Chymical Dissertations on the Causes of the Epidemic called the Yellow Fever; and on the best Antimonial Preparations for the Use of Medicine.* By a Physician, Practitioner in Philadelphia. Philadelphia. *Snowdon* and *M'Corkle.* 8vo. pp. 41. 1796.

WE learn from a vote of thanks annexed to each of these Dissertations, that the author is FELIX PASCHALIS OUVIERE, Doctor of Divinity and of Physic, in Philadelphia; and from the queries prefixed to each, that they are intended as answers to Prize Questions proposed in 1794 and 1795, by the Medical Society of Connecticut. We rejoiced to find the Physicians on the one side of New-York, promoting useful inquiry at their annual sittings, and endeavouring to bring forward professional talents; and a practitioner on the other side making answers, which the querists call "ingenious," and "very ingenious and entertaining." We had little doubt, in turning over at first the leaves of the pamphlets, and finding this to be the case, we should be struck with the *ingenuity*, and pleased with the *entertainment* it afforded, in as high a degree as the Medical Society of Connecticut appear to have been. It must be owned, however, that the expectation raised by the commendations of that medical body, and their resolves of thanks, have in a good degree been disappointed on the perusal of the performances. And we cannot but regret, that Public Institutions are not more circumspect in distributing their compliments and honours.

From these general remarks, we shall, however, proceed to the separate consideration of the pieces themselves.

The Dissertation which stands first, is intended as an answer to the following prize-question: "*What are the Chymical properties of the effluvia of contagion of the epidemic of New-York, in the year 1795; what its mode of operation on the human body; and does said epidemic differ from the usual fevers of this country except in degree?*"—To which Dr. Ouviere replies, that "the chymical properties "of the effluvia, or *principles* of the epidemic of New-York, "which raged also through several towns of the United States, "are those of the abundant heat or excessive caloric of the at-"mosphere; that this caloric operates on the human body, by sa-"turating itself with all the aqueous particles of the blood, until "*it* reduces *it* to *its* putrid fermentation;" and that "the Yellow "Fever differs entirely from the bilious intermitting of this coun-"try, which is owing only to the alteration or putrefaction of the "bile:"—and so the writer informs the proposers of the question, that the chymical properties of the effluvia of the epidemic of New-York, and of other parts of North-America, are those of exces-

sive heat in the atmosphere, which saturates itself with the watery particles of the blood, and reduces it to a putrid fermentation! and that this Yellow Fever is wholly different from the Bilious Intermitting Fever of this country!

In order to come to this conclusion, Dr. Ouviere considers the distemper in New-York, during the summer and autumn of 1795, as the same which prevailed in Philadelphia in 1793. He does not dispute whether it is of foreign derivation, or of local origin at home, but thinks "such a fever is epidemical whilst its remote "or primitive cause proceeds wholly from the state of the atmos-"phere; but this cause acts as a contagion infecting the body with "all the principles of its own putrefaction." He affirms the certain prognostic to be a complete decomposition of the whole mass of blood in the course of six or seven days. To establish this latter point, he takes a three-fold view of the disease. 1. The analysis of the symptoms. 2. The accidents attending it. (What are symptoms but accidents?) And, 3dly. The appearances on dissection; and endeavours to prove therefrom the putrid decomposition of the blood in the living vessels. We are grieved to find that, at this time, there are any supporters of that deceitful hypothesis: and while we recommend to Dr. Ouviere an attentive examination of the different appearances which the blood assumes in the course of the disease, both from internal causes, and the introduction of substances ab extra, we would caution him against giving his assent to the notion of a *putrefactive fermentation* going on there; an opinion, as we believe, false in itself, leading to wrong estimates of the virtues of remedies, and consequently productive of erroneous and mischievous management in practice. The author then goes on to remark, that, being drained of its aqueous particles, the blood will be rendered unfit for the different animal functions: and that uncommon heat of the atmosphere, and many internally heating causes, will bring on such a condition of that fluid, by dissipation of its watery part, as to induce, among others, malignant, putrid, and epidemic diseases. These are produced by destroying the equilibrium, which ought to exist among the constituent elements: and after the destruction of this equilibrium of the blood by caloric, a decomposition is produced, which, according to our author, is neither more nor less than putrefaction.

Impressed with this idea, he proceeds to inquire, whether contagion or miasmata, introduced into the blood, can make it putrefy? And though he seems to allow there are facts which support the affirmative of the question, yet, upon the whole, there is not sufficient ground for the theory in the present case; he therefore rejects the introduction of effluvia into the blood, as an inadequate cause of its putrefaction.

He then examines whether the decomposition of the blood, which with him is the essence of the malady, is caused by the bile? and considers this opinion as adopted upon feeble and inconclusive evidence.

Having thus removed the impediments to his investigation, Dr. Ouviere proceeds to explore this abstruse subject in his own way. In doing this, he calls in the aid of the New Chemistry, which has been applied with so much success of late, to explain the phenomena of organized bodies, and even to elucidate some of the functions of living beings.

The author mentions the analysis and synthesis of water; but declines enumerating the component parts of the blood, or the changes they are prone to undergo from chymical attraction. To the water in the blood corrupting, as in every putrefying substance, he looks for the efficient cause of all the febrile phenomena. Water converted into steam, (or *aqueous gas*, to use the word of our author) by caloric, is the great disorganizer of animal and vegetable substances after death, and of the circulating blood before death. And by this first and only agent, either in the form of ice, water, or steam, are most phenomena during life, and after death, to be accounted for. *Aqueous gas* was the cause of the distemper in New-York, in 1795, and of all similar distempers that have visited the United States; and it operated by breaking down and removing whatever obstacles were in its way, and by its *specific levity* disengaging itself from every thing, leaving the other component atoms to form ammoniac, nitric acid, &c. according to their respective affinities. In short, putrefaction of the blood was the cause of the Yellow Fever, and *aqueous gas* was the cause of the putrefaction, and caloric was the cause of the expansion of the watery portion of the blood into aqueous gas.

It is extremely unpleasant to be obliged to review such reasoning as this. To extract a meaning from sentences obscurely composed, is at all times laborious; and to interpret words employed in the most vague and indefinite manner in every paragraph, is a perplexing task: but all this and more our patience could submit to, were we to be compensated for our pains. This part of the performance now before us, gives us indeed a deal of disagreeable work, and a very inadequate reward. We can hardly persuade ourselves to offer any further criticism upon it. Dr. Ouviere is, however, requested to consider whether *aqueous gas* can be formed (he admits the fact himself, p. 12.) under the 80th degree of Reaumur's scale? (212th of Fahrenheit's) whether the heat of human blood ever, in the hottest fever, exceeds much more than half that amount? whether experiment has not ascertained that the temperature of the vital parts is, *cæteris paribus*, nearly the same, at all seasons of the year? whether, therefore, aqueous

gas can be formed at the heat of human blood? and in the blood-vessels? from the serum? and rather in summer and autumn than at other times of the year? when the blood is equally warm or more fraught with water? It is a strange opinion of this gentleman that the blood oftentimes waxes boiling hot (80 degrees Rem. or 212 Fahren.); and when such a phenomenon happens in the body, an abundant perspiration transudes from all its parts, and chiefly from the breast.

The author next proceeds to answer two objections to his hypothesis. The first is, that if aqueous gas, (boiling steam) formed in the blood was the cause of yellow fever, all persons ought to die of it; to which he thinks he has made a sufficient reply when he says, that in abundance of cases aqueous gas is formed so gradually, and the putrefaction occasioned by it operates so moderately, that there is time for art to relieve the patient before a fatal decomposition is wholly effected. The second objection is derived from the heat of the atmosphere, which might be supposed, he thinks, to produce a similar decomposition in the blood every where, especially between the tropics; and this he obviates in a manner that we confess we are unable to comprehend.

Though Dr. Ouviere is so defective in the philosophical part of his dissertation, it is but candid to pronounce that he appears to more advantage in his "Practical Cautions" and "Method of Cure." In the *former* he recommends washing, cleaning, &c. running streams of water brought into towns; vegetable diet of ripe fruits, greens and seeds; sparing use of spirituous liquors; frequent warm bathing; avoiding the exhaustion of strength by excessive heat and sweating; drinking of claret wine mixed with water; small liquid purgatives; the removing of crudities from the stomach and intestines, and, generally, attention to the peculiarities of each individual constitution. All this we believe to be good advice, and we join our recommendation to that of Dr. Ouviere, in order to encourage our fellow citizens to adopt the mode. Much benefit will undoubtedly accrue from it, both in city and country. In the *latter*, his first indication of cure is to restore to the blood, and all the animal fluids, as many watery particles as they have lost, by the caloric. This indication he fulfils by acidulous, cooling and diluting draughts, such as barley-water and gruel, chicken or veal broths, and milk whey. From the general distatse which the sick express for animal food, and for other reasons which, if it would not swell this article too much, we could easily express, we think the soups and whey may be omitted, in the beginning of the disorder especially, and ripe fruits, cold water and oxymel, and, in general, farinaceous and saccharine substances, mixed with a large proportion of water, substituted in their place. In addition to these things, he recommends

the use of the warm bath, a time or two, early in the disease. Practisers have disputed whether, if the bath were proper at all, it ought to be cold or warm: some have recommended *one*, and some the *other*; and some again *both* alternately, in quick succession. Our own opinion is, they are all useful, by removing pestilential matter from the body, as well as by procuring for it an agreeable temperature. We believe the cold bath practice has been frequently carried too far, from a misrepresentation of its mode of operation; and are inclined to think, upon the whole, the *tepid* bath may be as efficacious as any, and upon the whole, the most safe.

The second indication is to remove the morbific matter, resulting from the decomposition of the blood: and this he says ought to be efficacious and active, to prevent the rapid progress either of the inflammation or putridity. For this purpose he recommends repeated bleedings to be begun even *before* the use of the bath, and these not to be omitted even in fat and weak habits. On this controverted point of venæsection, besides the authority of Dr. Ouviere, and the practice of De Haen, Sydenham, La Montagne, Stubbs, &c. we can add our own experience of its high utility, in many cases of autumnal distempers of this country, as it has been advantageously practised in the New-York Hospital during the pestilence of 1796, at repeated times, to the amount of from 24 to 175 ounces, and in some cases several times performed after the sixth day of the disease, to the great relief of the sick. Mistaken notions about the putrid state of the blood and humours, and concerning the use and operation of what are called alexipharmic and antiseptic remedies, have induced many physicians of late to oppose this practice. But experience of the great benefit to be derived from it, is happily getting the better of these ill-founded and hypothetical prejudices. As far as we can judge of the practice of many of the most reputable writers in physic, and from our own observations, we are clear in our opinion, that though venæsection may be and has been abused, yet it is justly to be reckoned one of the most proper remedies that can be employed in the greater part of these pestilential maladies, and that a large portion of the sufferings of the sick have been endured by reason of its total omission, or too tardy and limited use.

Immediately after bleeding, our author advises strong epispastics; and it must be observed, that in cases of considerable local affections of the head, stomach, or breast, they have been productive of good effects, and ought to be applied.

He next proposes the employment of cathartics, and even of the drastic kind, to clear the alimentary canal, and to repeat these according to the exigency of the case. The calomel and jalap which

he mentions as having been frequently successful, is, however, not a new remedy. More than an hundred years ago we find, that a scruple of calomel, mixed with half a scruple of resin of jalap or scammony, had been prescribed, and, as it is related, with remarkable benefit in febrile diseases, by Professor Riverius, the famous physician of Montpellier. This was his great febrifuge, and he almost made a sort of nostrum of it. The renewal and repetition of this practice in America, coincides remarkably with the effects ascribed to it by the French practitioner.

Dr. Ouviere also observes, that antiseptic medicines have been too much used during the Yellow Fever in Philadelphia. We consider this a just remark, and are satisfied, that in numberless instances, Peruvian bark, snake-root, &c. have done more hurt than good.

On the whole, while we declare our sentiment, that the author has wholly failed in his attempt to explain the chymical properties of contagion, and its manner of operating on the constitutions of men, and is mistaken in his opinion of the Yellow Fever, *differing entirely* from the common fevers of America; we, without hesitation, do him the justice to observe, that the practical directions (which are not asked for in the Society's queries) are such, as in general are safe and well-adapted as far as they go.

THE *Second Dissertation* is a professed treatise on the Antimonial Preparations which best answer the different indications in fevers, and on the necessary modes of their exhibition: proposed by the Connecticut Society as another Prize Question. Of this it may be remarked, that it contains chiefly the common accounts of the history and preparations of Antimony, in a more imperfect form than they are to be found in most of the modern books on chemistry. The author dwells most particularly upon *tartar emetic*, and *kermes mineral*, (red sulphurated oxyd of antimony,) to the latter of which he is particularly attached, and declares it to be the best antimonial preparation that physic can employ in a great number of "diseases, and indications of fevers:" And closes the dissertation with a particular enumeration of its virtues and mode of administration. In doing this, Dr. Ouviere appears to us to shew the partiality, very commonly possessed by physicians for a favourite remedy.

MEDICAL FACTS, HINTS, AND INQUIRIES.

INOCULATION.

IT has lately become a question, in Great-Britain, whether the degree of *fever*, and quantity of *eruption*, in the inoculated small-pox, are not modified by the quantity of matter introduced into the system, by inoculation. It is the opinion of Dr. George Fordyce, that the number of pustules will be greater, and the fever more severe, when much matter is inserted, than when but little is inserted; and this opinion is countenanced by two communications, made to Dr. Beddoes, and lately published by that gentleman, at the end of his translation of Gimbernat's "New Method "of Operating for the Femoral Hernia." And since, still further supported by communications from Dr. Thornton and Mr. Field, printed in Dr. Beddoes' "Considerations on the Medicinal Use, "&c. of Factitious Airs."

I wish to call the attention of practitioners of medicine to this point. No country is under better circumstances to determine the question, than the United States; in which inoculation is almost universally practised, and where some physicians have opportunity of making several hundred observations every year.

I have always been in the practice of inserting a very small quantity of dilute matter, by a small incision; though, I confess, not from any expectation of mitigating the disease by this means.—When an incision is large, the blood is apt to wash away the matter, or the local inflammation throw it off. And if it be not fluid, it is an impediment to its ready absorption. All these inconveniencies are prevented by dilution and a small puncture. But, if a milder disease is communicated by it also, there is a more important reason for observing the practice.—Mr. Field's letter is pointed on this subject. He declares, that he has followed the practice of inoculating with matter so diluted that he cannot have used more than a "drop or two," for more than twenty years; in which time he and his pupils have inoculated upwards of *two thousand* persons, without the loss of more than *one*.*

* Mr. Field prefers the thin matter which first appears in the pustules, to that which is maturated; and diluted in the proportion of about 100 parts water, to one of matter. He never draws blood.

In all the cases which have fallen under my care, I do not remember but a single instance where the patient has had so many as thirty pustules; and this depended on circumstances no wise connected with the manner of performing the operation, and arose from causes sufficiently obvious. My patients have been of various ages, from two months to thirty years.

On the other hand, I have had occasion to observe, in numerous instances, where the incision was large, and the quantity of matter inserted considerable,—especially when the *thread* was used,—that the patients either had very sore arms, or great numbers of pustules; and oftentimes with several days of severe pain and fever. I do not pretend that this uniformly happens. Constitution, treatment, and accident, may, and must, produce variety. But still it seems highly interesting to determine how far their influence extends; and whether any, and what, effect is to be attributed to the greater or lesser quantity of variolous matter, introduced into the system, by inoculation.

Communications are requested, from all parts of the United States, and elsewhere, on this subject.

CARBON.

DR. PEARSON, (p. 159, Beddoes' Considerations, &c. on Factitious Airs. P. iii.) speaking of the internal exhibition of *yeast*, seems to suppose that its having in one instance caused vomiting and in another purging, is to be ascribed to the *bitter principle of the hop*. Dr. Thornton (p. 160.) controverts this Doctrine, and considers eructations as the evidence of the operation of the medicine. Perhaps the following remarks may throw some light on the question:—

Simple carbon, or charcoal deprived of its oxygen by heat, has been administered, in the New-York Hospital, in perhaps 15 or 20 cases. In no instance, as far as I can remember, has it failed to purge; and in several, the purging and intestinal commotion excited by it have been so great, that we have been obliged to discontinue it.—Combined, however, with carbonate of soda *(sal sodæ,)* and particularly with the addition of lenitive electuary, it has proved, in my hands, one of the gentlest and most efficacious remedies for the removal of habitual costiveness, I have ever known. I have thought, too, that this combination has had other and more salutary effects, in a few cases of Scrofula and Consumption, in which I have administered it. But further and more nice observations are necessary to determine the point.

The following formula is that which I have used.

Take of Lenitive Electuary,	℥ iv	}	Mix.
Carbonate of Soda,	ʒ ii		
Carbon,	ʒ ii		

Of this from ʒ ss to ʒ i and ʒ ii, to be taken twice, thrice, or more times in the day, according to circumstances.

SIPHILIS.

JOHN CLARKE was admitted into the New-York Hospital, Sept. 7, 1796. Six weeks before this date he was seized with venereal *running and scalding*. After the appearance of the Gonorrhœa, he had intercourse with other women; and in a fortnight from its breaking out, he had a *Chancre* come on the outside of the prepuce; the Glans being naturally hooded. About a week after the chancre made its appearance, a bubo formed in the left groin; which opened of itself, yesterday; and now discharges freely.

A case of Gonorrhœa and Siphilis, equally distinct, and with equal probability of having originated from separate infection, fell under Dr. Rodgers's care the ensuing autumn or winter.

Do these facts go any way towards the confirmation of Mr. Bell's doctrine, that Gonorrhœa and Siphilis are different diseases?

SIPHILIS AND FEVER.

IN the summer of 1796, a man came into the New-York Hospital in a state of salivation. On inquiry, we discovered that he had the venereal disease—chancres, or buboes, or both—for which he had taken mercury, so as to produce the salivation; which was of some standing. But, beside that he had siphilis and was salivated, he had an *Intermitting Fever*, of some standing also, and which was more than commonly obstinate. He got well, by the use of the ordinary remedies; but not till he had one or two relapses of the fever.

Remark. It is nothing new for an Intermittent to proceed, notwithstanding a salivation, and even to arise during it—(see HOFFMAN *de bile Medicin, &c.* § 29. and Van Sweiten's Comment. on Aphorism, 757.) but that it should exist at the same time, and for several weeks, with Siphilis, has, I believe, never been publicly noticed till now.

Quere. Does this fact form any objection to Mr. Hunter's theory of the impossibility of different contagions displaying their effects, co-ordinately, in the same person? Or, are we to infer from this that the contagion of fever and siphilis are the same? The nitric acid, according to Mr. Scott and others, cures hepatic swellings; and these are often the consequences of intermittents. It also cures siphilis. Should future trials demonstrate this acid to be equally successful in the cure of intermittent, remittent, and yellow fevers, would it be fair to conclude that the immediate cause of these fevers and of siphilis are but modifications of one common principle?

E. H. S.

☞ *In the following Meteorological Tables some explanation may perhaps be necessary. The figures, in the columns of clear and cloudy, denote the times of observation. Thus, when the figure* 1 *occurs in the first of these columns, and in the second likewise, it signifies that the sky was clear at the first, and cloudy at the second, observation. When the figure* 2 *occurs in either column, it signifies that the sky was clear, or cloudy, at both times of observation.*

The Thermometrical Observations are made on Fahrenheit's Thermometer.

METEOROLOGICAL OBSERVATIONS *for January*, 1797, *made by* GARDINER BAKER, *in the Cupola of the Exchange in the City of* New-York.

Days of the Mon.	Thermometer observed at 7 A. M.	Thermometer observed at 3 P. M.	Prevailing winds. 7 M.	Prevailing winds. 3 E.	Clear.	Cloudy	Barometer observed at 7 A. M.	Barometer observed at 3 P. M.
1	27	33	W	W	2		29 80	29 88
2	23	28	N W	W	2		29 97	30 7
3	22	26	N E	N E		2	30	29 80
4	19 50	30	N W	S W	1	1	29 78	29 67
5	23 50	28 50	W	W	2		29 60	29 67
6	27 75	39 25	S W	W	2		29 52	29 43
7	17	22 50	N	W	1	1	29 85	29 90
8	3 50	15	N	N E	2		30 20	30 30
9	0	16	N	N	2		30 47	30 50
10	3 50	24 25	N W	S W	2	w.fro	30 47	30 32
11	23	36	E	S E		2	30 15	29 84
12	32 50	38	W	W	2		29 68	29 78
13	31	40 50	N W	W	2		30 10	30 14
14	30	33 25	S W	N E		2	29 98	29 70
15	33 75	41	N W	W	2		29 70	29 75
16	32	41	S W	N W	2		29 45	29 47
17	26	31	N W	N W	2		29 94	29 99
18	23 50	32	S E	S		2	29 95	29 79
19	27	28	N W	N	2		30 6	30 25
20	18 50	28	N E	N E		2	30 30	30 23
21	24	28	N E	N E		2	30 21	30 16
22	23	29	N E	N W		2	30	29 95
23	27 50	37	S W	S W	2		29 99	29 80
24	26	41	W	W	2		29 74	29 85
25	20	27	N W	S E	2		30 5	30 19
26	28	42	S	S	1	1	30 15	29 97
27	36	45 50	S W	S W	2		29 95	29 80
28	39	46	S W	S W	1	1	29 55	29 58
29	36	44	E	E	1	1	29 50	29 23
30	27	35 50	N W	W	2		29 65	29 85
31	24 50	30	E	E		2	30 13	30 50

Results of Meteorological Observations for January, 1797.

Mean temperature of the Thermometer at sun-rise, deg. 24 35 hund.
Do. do. of the do. at 3 P. M. 32 78
Do. do. of the do. for the whole month, 28 56
Greatest monthly range, between the 9th and 28th, 46
Do. do. in 24 hours, on the 10th, 20 75
Six days it snowed, and about 8¼ inches have fallen.
Five days it rained, and a large quantity has fallen.
Coldest day, the 9th. Warmest day, the 28th.

METEOROLOGICAL OBSERVATIONS *for February*, 1797.

Days of the Mon.	Thermometer observed at 7 A. M.	Thermometer observed at 3 P. M.	Prevailing winds. 7 M.	Prevailing winds. 3 E.	Clear.	Cloudy	Barometer observed at 7 A. M.	Barometer observed at 3 P. M.
1	30	30	E	E		2	30 6	30 4
2	37	49	W	W	1	1	29 53	29 60
3	32	44	W	W	2		30	29 95
4	31	40	W	W	2		29 95	29 95
5	31	42	S	S E	2		30 7	30
6	40 50	50 50	S W	S W		2	29 71	29 46
7	34	36	W	N W	2		29 70	29 80
8	26	38	W	W	2		30 1	30 18
9	31 50	42	S	S E	2		30 5	30 3
10	44	48	S E	S E		2	29 69	29 48
11	40	44 50	N	N W		2	29 41	29 55
12	31	53 25	W	W	2		29 61	29 72
13	36	38	N E	E		2	29 90	29 80
14	35	36	N E	N E		2	29 60	29 46
15	27	30	N E	N W		2	29 68	29 78
16	25	33	N W	N W	2		30 18	30 20
17	25	39	E	S		2	30 24	29 95
18	36	41	N W	N W		2	29 70	29 72
19	31	46	calm	S W	2		29 97	29 85
20	38	50	S W	S W	1	1	29 57	29 43
21	23	32	N E	S	2		29 89	29 91
22	34	52	E	W	1	1	29 38	29 26
23	32	42	E	S E	2		29 81	29 81
24	50	57	N W	N W		2	29 38	29 50
25	33	35	S W	W	2		29 65	29 53
26	16	23	N W	W	2		29 79	29 90
27	38	47	S	S W		2	29 84	29 73
28	34	35	N W	W		2	29 73	29 73

Results of Meteorological Observations for February, 1797.

Mean temperature of the Thermometer at sun-rise, deg. 32 9 hund.
Do. do. of the do. at 3 P. M. 41 2
Do. do. of the do. for the whole month, 36 55
Greatest monthly range, between the 24th and 26th, 41 0
Do. do. in 24 hours, between the 26th and 27th, 22 0
One day it snowed, and 2½ inches have fallen.
Seven days it rained, and a large quantity has fallen.
Coldest day, the 26th. Warmest day, the 24th.
On the 26th a remarkable appearance of the Aurora Borealis in the evening, at the north point. Its appearance changed several times, and at length collected in a pyramidical form and disappeared.

METEOROLOGICAL OBSERVATIONS *for March*, 1797.

Days of the Mon.	Thermometer observed at 7 A. M.	3 P. M.	Prevailing winds. 7 M.	3 E.	Clear.	Cloudy	Barometer observed at 7 A. M.	3 P M.
1	22	35	N W	N W	2		29 97	30 1
2	24	37	N E	S E	1	1	30 17	30 14
3	33	42	N E	S W		2	29 85	29 89
4	38	49 50	S	W	1	1	29 67	29 56
5	50 50	54	W	W	1	1	29 20	29 24
6	22	25	N W	N W	2		29 69	29 81
7	19	28	N W	S W	1	1	30 1	29 90
8	37	60	S W	S W	1	1	29 30	29 4
9	25	30	N W	N W	2		29 80	29 89
10	19	32	N W	N W	2		30 20	30 24
11	28	33	S	E		2	30 16	29 98
12	28	36	S	S	1	1	30 10	30 17
13	36	43				2	30 9	30
14	45	62	S	S	1	1	29 80	29 73
15	36	44	N E	N E		2	30	30 9
16	33	36	E	N E		2	30 27	30 17
17	38	48	E	E		2	29 90	29 67
18	48	62	S W	W	1	1	29 51	29 31
19	41	46	W	W	1	1	29 47	29 52
20	30	44	N W	N W	2		29 77	29 78
21	30	51	W	S	2		29 88	29 84
22	42	45	S E	E		2	29 70	29 32
23	39	56	N W	N W	2		29 42	29 70
24	42	46	S E	S E	1	1	29 90	29 74
25	47	52	W	N W	2		29 55	29 75
26	32	40	E	S	2		30 9	30 9
27	47	55	S	N W	1	1	29 40	29 23
28	34	37	N W	N W	1	1	29 59	29 70
29	30	45	calm		2		30	30 1
30	34	43	E	S E	1	1	30 2	30
31	40	43	S E	S		2	29 78	29 55

Results of Meteorological Observations for March, 1797.

Mean temperature of the Thermometer at sun-rise, deg. 34 50 hund.
Do. do. of the do. at 3 P. M. 43 85
Do. do. for the whole month, 39 75
Greatest monthly range, between the 7th and 18th, 43 0
Do. do. in 24 hours, between the 8th and 9th, 35 0
Three days it snowed, and about eight inches have fallen.
Nine days it rained, and a very large quantity has fallen.
Coldest day, the 7th. Warmest day, the 18th.
Two thunders and lightnings, one of which was heavy.
A number of remarkable heavy winds have occurred this month.

METEOROLOGICAL OBSERVATIONS *for April*, 1797.

Days of the Mon.	Thermometer observed at		Prevailing winds.		Clear.	Cloudy	Barometer observed at	
	Sun-rise.	3 P. M.	S.r.	3 E.			Sun-rise.	3 P. M.
1	43	49	N W	N W	1	1	29 50	29 50
2	40	48	S W	S E	2		29 70	29 50
3	46	70	S	S	2		29 65	29 75
4	46	60	E	S	1	1	29 84	29 70
5	54	82	S W	S W	2		29 69	29 60
6	56	56	N	E		2	29 61	29 61
7	44	42	N E	E		2	29 68	29 60
8	39	40	E	E		2	29 45	29 30
9	42	54	N W	N W	2		29 34	29 98
10	36	48	N W	N W	2		29 70	29 72
11	38	56	W	W	2		29 75	29 62
12	44	48	N W	S E	1	1	29 65	29 65
13	41	38	E	E		2	29 55	29 40
14	35	58	N	W	2		29 50	29 60
15	47	58	S W	S	1	1	29 62	29 60
16	45	44	E	E		2	29 60	29 61
17	37	49	N E	S E	2		29 69	29 60
18	37	38	E	N		2	29 30	29 4
19	37	45	N	N		2	28 97	29 30
20	41	50	N W	N W		2	29 50	29 55
21	43	55	S W	S W	1	1	29 72	29 67
22	44	58	S	S	2		29 70	29 70
23	46	48	S E	E		2	29 70	29 72
24	44	49	E	E		2	29 78	29 68
25	48	60	S	S	1	1	29 39	29 37
26	49	63	S W	S W	2		29 49	29 49
27	42	56	N E	S E	2		29 76	29 83
28	44	61	E	S	2		29 85	29 80
29	50	71	E	E	2		29 75	29 74
30	52	59	E	N E		2	29 80	29 75

Results of Meteorological Observations for April, 1797.

Mean temperature of the Thermometer at sun-rise, deg. 43 6 hund.
Do. do. of the do. at 3 P. M. 53 7
Do. do. for the whole month, 48 65
Greatest monthly range, between the 5th and 14th, 47
Do. do. in 24 hours, on the 5th, 28
Twelve days it rained, and an uncommon quantity has fallen.
One day it snowed, and about six inches have fallen.
Coldest day, the 14th. Warmest day, the 5th.
Three times it thundered and lightned, and there was considerable.

METEOROLOGICAL OBSERVATIONS *for May*, 1797.

Days of the Mon.	Thermometer observed at Sun-rise.	3 P. M.	Prevailing winds. S.r.	3 P.	Clear.	Cloudy	Barometer observed at Sun-rise.	3 P. M.
1	56	70	S	S	1	1	29 55	29 52
2	51	58	E	E		2	29 55	29 70
3	42	47	N W	S E		2	29 70	29 80
4	50	68	S W	N W	1	1	29 53	29 55
5	50	51	S E	S E	1	1	29 45	29 41
6	51	68	N W	S W	2		29 24	29 75
7	55	59	W	W	2		29 15	29 17
8	42	57	W	W	2		29 38	29 40
9	44	55	N W	N W	1	1	29 59	29 39
10	50	70	S	S W	1	1	29 77	29 70
11	55	75	S W	S	2		29 78	29 72
12	55	64	S E	E		2	29 62	29 41
13	56	69	W	S W	2		29 40	29 44
14	46	55	N W	S W	1	1	29 70	29 73
15	47	59	S	S	2		29 65	29 60
16	50	57	N	S E		2	29 65	29 64
17	48	62	N W	S	2		29 81	29 81
18	53	67	S	S		2	29 69	29 59
19	51	65	N	S	2		29 75	29 80
20	51	55	E	S E		2	29 80	29 64
21	57	70	S E	S E	1	1	29 49	29 31
22	60	72	N W	W	2		29 50	29 53
23	56	65	S E	S E	2		29 39	29 44
24	54	66	E	E	1	1	29 40	29 41
25	54	69	E	E	1	1	29 36	29 38
26	55	71	N	S	2		29 59	29 65
27	55	62	E	S E	1	1	29 73	29 65
28	60	68	S W	N W	1	1	29 50	29 52
29	55	71	W	S W	2		29 68	29 68
30	55	52	E	N E		2	29 70	29 65
31	52	66	N	N W	1	1	29 59	29 61

Results of Meteorological Observations for May, 1797.

Mean temperature of the Thermometer at sun-rise, deg. 52 13 hund.
Do. do. of the do. at 3 P. M. 63 3
Do. do. for the whole month, 57 58
Greatest monthly range, between the 3d and 11th, 33
Do. do. in 24 hours, between the 10th and 11th, 20
Thirteen days it rained, and a very large quantity has fallen.
Six days it thundered and lightned, and in great abundance.
Coldest day, the 3th. Warmest day, the 11th.

METEOROLOGICAL OBSERVATIONS *for June, 1797.*

Days of the Mon.	Thermometer observed at Sun-rise.	3 P. M.	Prevailing winds. S.r.	3 E.	Clear.	Cloudy	Barometer observed at Sun-rise.	3 P. M.
1	50	69	N W	W	2		29 80	29 76
2	50	62	N W	S E	1	1	29 76	29 67
3	59	76	S	S	1	1	29 61	29 71
4	50	61	S E	S E		2	29 70	29 55
5	63	73	W	N W	2		29 32	29 44
6	55	71	S	S	2		29 66	29 60
7	63	78	W	S W	2		29 61	29 70
8	59	72	E	S E	2		29 85	29 90
9	64	78	E	E	1	1	29 90	29 83
10	64	74	S	S E	1	1	29 70	29 57
11	66	80	N W	N W	2		29 65	29 66
12	64	81	W	S W	2		29 70	29 65
13	70	76	S W	S E		2	29 65	29 46
14	64	78	N W	N W	2		29 56	29 64
15	66	85	S W	W	2		29 63	29 74
16	60	77	E	E		2	29 60	29 54
17	66	77	W	N	2		29 54	29 56
18	62	77	E	N E		2	29 57	29 30
19	54	69	N	W	1	1	29 64	29 73
20	57	69	E	S	2		29 85	29 85
21	58	70	E	S E	1	1	29 88	29 91
22	60	66	E	S E		2	29 84	29 68
23	60	64	S E	N E		2	29 44	29 44
24	63	71	W	S		2	29 45	29 50
25	66	82	N W	N W	2		29 72	29 75
26	66	82	N W	W	2		29 86	29 86
27	66	81	S	S	2		29 90	29 93
28	65	79	S W	S W	1	1	29 91	29 90
29	66	84	S W	S	2		29 83	29 80
30	68	89	S W	S W	2		29 79	29 79

Results of Meteorological Observations for June, 1797.

Mean temperature of the Thermometer at sun-rise, deg. 61 4 hund.
Do. do. of the do. at 3 P. M. 75 1
Do. do. for the whole month, 68 2
Greatest monthly range, between the 1st and 30th, 39
Do. do. in 24 hours, on the 30th, 21
Nine days it rained, and a very large quantity has fallen.
Seven days it thundered and lightned, and in great abundance.
Coldest day, the 1st. Warmest day, the 30th.

A TABLE *of Patients admitted into the New-York Hospital, from the 1st of January, 1797, to the 1st of July, 1797; shewing the disease for which each was received, with the event of the case.—N. B. This Table will be continued in the future numbers of the Repository; and hereafter it is the design of the Editors to render it more ample, and in all respects more correct.*

MEDICAL *Patients received in January.*

DISEASES.	No	Cured.	Reliev.	Died.	Remain under Care.
Pneumony	8	8			
Fever	3	3			
Pulmonary Consumption	2		1	1	
Gonorrhœa	2	2			
Syphilis	10	10			
Rheumatism	11	11			
Natural Small-pox	1			1	
Ischuria	1	1			
Diarrhœa	1	1			
SURGICAL.					
Film on the Eye	1	1			
Tumor	1	1			
Frozen Limbs	10	8		1	1
Ulcer of the Leg	3	2	1		
Wound in the Thigh	1	1			
Wound of the Leg	1	1			
Wound of the Side	1	1			
Fractured Arm	1	1			

Februdry. MEDICAL.					
Pneumony	4	2		2	
Anarsarca	4	2		2	
Syphilis	4	4			
Fever	4	3		1	
Herpes	1	1			
Hæmoptysis	1	1			
Diseased Hip Joint	1				1
SURGICAL.					
Ulcer of the Leg	4	4			
Laceration	1	1			
Frozen Limbs	2	1	1		
Burn	1	1			

Received	58
Cured	52
Relieved	2
Died	3
Remains	1
	58

Received	27
Cured	20
Relieved	1
Died	5
Remains	1
	27

March.	N.	Cured.	Relieved.	Dead	Remain.	Discharged. or eloped.	Result.	
MEDICAL.								
Syphilis	10	10					Received	25
Fever	1	1						
Rheumatism	4	3				1		
Amenorrhea	1	1					Cured	24
Pneumony	3	3					Disorderly	1
SURGICAL.								25
Fractured Arm	2	2						
Ulcer of the Leg	2	2						
Wounded Hip	1	1						
Dislocation	1	1						
April.								
MEDICAL.								
Scrofula	1	1					Received	40
Cancer	1			1				
Colic	1			1			Cured	29
Rheumatism	4	4					Relieved	1
Syphilis	16	16					Dead	4
Pneumony	5	4		1			Eloped	2
Amenorrhea	1					1	Remain	4
Opthalmia	1				1			40
Palsy	1				1			
Fever	2	2						
Enteritis	1			1				
SURGICAL.								
Tinea	1	1						
Scrofula	1				1			
Luxation	1	1						
Fracture	2		1			1		
Lumbar Abscess	1				1			
May.								
MEDICAL.								
Pulmonary Consumption	1		1					
Pneumony	4	2		1	*1			
Syphilis	7	7						
Rheumatism	3	1			2			
Fever	3	2		1				
Dropsy	2	2						
Mania	2		1	1				

* As this patient was nearly well, he was seized with Rheumatic pains; and as they were removed, with Intermittent Fever, which preceded the eruption of the natural Small-pox. He is now recovering from a Fever which followed the Small-pox.

SURGICAL.

DISEASES.	No	Cured.	Reliev.	Dead.	Remain under Care.	Result.		
Sore Legs	3	3				Received		28
Fistula	1	1						
Swelled Testicles	1	1				Cured	19	
Apoplexy	1			1		Relieved	2	
						Dead	4	
						Remain	3	
								28

June. MEDICAL.

Dropsy	1				1	Received		31
Mania	7	2	2		3			
Syphilis	9	3			6	Cured	8	
Pulmonary Consumption	2			1	1	Relieved	2	
Rheumatism	3				3	Dead	1	
Dyspepsia	1	1				Remain	20	
Fever	5	2			3			
								31

SURGICAL.

Sore Legs	3				3			

SUMMARY.

Patients received into the New-York Hospital from the first of January to the first of July, 1797, exclusive of those then remaining under care, 209

Of this number have been *cured*,	152
relieved,	8
have *died*,	17
eloped,	3
Remain under *care*,	29
	209

A RETURN *of Patients admitted to the Care of the New-York City Dispensary, from the first of January to the first of July, 1797.*

JANUARY.

DISEASES.	No.	Cured.	Relieved.	Dead.	Removed to the Hospital.
Wounds	2	2			
Rheumatism	2	2			
Herpes	1	1			
Worms	2	2			
Fracture	1	1			
Cancer of the Uterus	1				1
Luxation	1	1			
Pulmonary Consumption	2			1	1
Hectic Fever	2	2			
Hooping-cough	1	1			
Dropsy	1			1	
Pneumony	5	5			
Menorrhagia	1	1			
Vomica	1	1			
Convulsions	1			1	
Epilepsy	1		1		
Sore Legs	2	2			
Head-ach	2	2			
Ascites	1				1
Syphilis	1	1			

Received					31
Cured	24				
Relieved	1				
Dead	3				
Removed to the Hospital	3				
					31

FEBRUARY.

Sore Legs	3		3		
Rheumatism	2	2			
Pneumony	3	3			
Palsy	1		1		
Hooping-cough	2	2			
Dyspepsia	3	3			
Fracture	1	1			
Quotidian Fever	1	1			
Erisipelas	1	1			
Burns	2	2			
Luxation	1	1			
Syphilis	2	2			
Ophthalmia	1	1			
Pulmonary Consumption	2			2	
Hectic Fever	1	1			
Scrofula	1	1			
Natural Small-pox	6	6			
Diarrhœa	2	2			
Head-ach	1	1			
Worms	1	1			

Received			37
Cured	31		
Relieved	4		
Dead	2		
			37

MARCH.

DISEASES.	No.	Cured.	Uncare.	Dead.	Removed to the Hospital.	Result.	
Diarrhœa	1				1	Received	33
Pneumony	5	5					
Rheumatism	2	2				Cured	29
Hysteria	1	1				Dead	1
Syphilis	3	3				Removed to the Hospital	2
Natural Small-pox	11	11					
Wounds	2	2					
Abortion	1	1				Removed to the Country	1
Luxation	1	1					
Intermitting Fever	1				Count.		
Remitting Fever	1	1					33
Abscess	1	1					
Pulmonary Consumption	1			1			
Herpes	1	1					
Anasarca	1				1		

APRIL.

Pneumony	6	6				Received	40
Ulcers	3	3					
Diarrhœa	5	5				Cured	36
Pleurodynia	1	1				Dead	2
Incipient Consumption	2	1			1	Removed to the Hospital	1
Luxation	1	1					
Rheumatism	3	3				Under care	1
Cough	2	2					
Catarrh	3	3					40
Syphilis	2	2					
Scrofula	1	1					
Diabetes	1	1					
Dropsy	2	2					
Pulmonary Consumption	1			1			
Inflammation of Bowels	1	1					
Dyspepsia	3	3					
Abscess	1		1				
Wound	1	1					
Convulsions	1			1			

MAY.

DISEASES.	No.	Cured.	Relieved.	Dead.	Remain under Care.
Natural Small-pox	12	12			
Dyspepsia	1	1			
Croup	1	1			
Scrofula	1		1		
Herpes	1	1			
Ulcer	1	1			
Pneumony	5	5			
Luxation	3	3			
Cough	3	3			
Rheumatism	1				(R. C.)
Syphilis	4	3			
Intermittent Fever	6	6			
Remittent Fever	2	2			
Pleurodynia	1	1			
Anasarca	2			1	(R.H.)
Head-ach	1	1			
Phrenitis	1	1			

Result.		
Received		46
Cured	41	
Relieved	1	
Dead	1	
Eloped	1	
Removed to the Hospital	1	
Removed to the Country	1	
		46

JUNE.

DISEASES.	No.	Cured.	Relieved.	Dead.	Remain under Care.
Head-ach	2	1	1		
Remitting Fever	3	3			
Cough	1	1			
Menorrhagia	1	1			
Epilepsy	1	1			
Wound	1				(Elop.)
Abscess	1	1			
Natural Small-pox	11	11			
Herpes	2	1			1
Sore Leg	1	1			
Pleurodynia	1	1			
Anasarca	1	1			
Worms	3	3			
Pneumony	3	3			
Hectic Fever	1				1
Rheumatism	2	2			
Diarrhœa	1				1
Pulmonary Consumption	1				1
Burns	2	2			
Parturition	1	1			
Contusion	1	1			
Gonorrhœa	1	1			

Result.		
Received		42
Cured	36	
Relieved	1	
Eloped	1	
Under care	4	
		42

SUMMARY.

Whole number of Patients admitted into the New-York City Dispensary from the first of January to the first of July, 1797,

229

Of this number have been *cured*,	. . . . .	197
relieved,	. . . . .	7
have *died*,	. . . . .	9
eloped,	. . . . .	2
Removed to the Hospital,	. . . . .	7
Country,	. . . . .	2
Remain under care,	. . . . .	5
		229

HUGH M'LEAN.

MEDICAL NEWS.

[☞ *This title is meant to include intelligence concerning Medicine, Natural History, Agriculture, &c. &c. both Foreign and Domestic. The difficulties which beset every undertaking of the nature of the Medical Repository, at its commencement, will, we hope, be deemed a sufficient apology for any imperfections which may be discovered in the present article. Every information, tending to render this part of our publication more complete in future, is respectfully solicited, and will be thankfully received.*]

DOMESTIC.

AT a meeting of the AMERICAN ACADEMY OF ARTS AND SCIENCES, (Massachusetts) the following officers were elected for the ensuing year, viz.

JOHN ADAMS, LL. D. (President of the U. S.) *President.*
JOSEPH WILLARD, D. D. *Vice-President.*

Hon. ROBERT T. PAINE, FRANCIS DANA, BENJAMIN LINCOLN, JOHN LOWELL, Esqrs. JOHN LATHROP, D. D. JOHN WARREN, M. D. JOHN CLARK, D. D. CALEB GARNET, Esq. Hon. COTTON TUFTS, and Mr. PROFESSOR WEBBER, *Counsellors.*

BENJAMIN DEARBORN, *Recording Secretary.*
Mr. PROFESSOR PEARSON, *Corresponding Secretary.*
THOMAS WELSH, M. D. *Treasurer.*
JOHN LATHROP, D. D. *Librarian and Cabinet-Keeper.*
Rev. JAMES FREEMAN, *Vice-Treasurer.*

The following gentlemen have lately been elected members of the Academy, viz.

Christopher Gore, Esq. of Waltham.
Sir John Sinclair, Bart. (President of the British Board of Agriculture.)
Dr. John Haliburton, of Halifax, (N. S.)
Edward Bancroft, M. D. F. R. S. of London.
Timothy Dwight, D. D. President of Yale College.
Samuel L. Mitchill, M. D. &c. of New-York.

DONATIONS to the *Academy.*

The Works of Francis Bacon, Baron of Verulam, 4 vols. folio. Presented by Dr. Isaac Rand.

Observations on the Increase of Infidelity, by Joseph Priestley, L L. D. F. R. S. Presented by the President of the Academy.

Agricultural Inquiries on Plaister of Paris, by Richard Peters. Presented by the same.

Communications to the Academy.

Variation of the Magnetic Needle, from January 24, to May 22, 1797. By Mr. Stephen Sewall.

Medical Observations on the Bilious Remittent Fever of 1796. By John Warren, M. D.*

Astronomical Observations respecting the extent of the Solar System, and distance of the Fixed Stars. By the Hon. Judge Winthrop.

A proposition for making Salt-petre from Pot-ash. By Joseph Greenleaf, Esq. [*Columbian Centinel, June* 21, 1797.

The *Second Part* of the *Second Volume* of the TRANSACTIONS of the American Academy of Arts and Sciences, is said to be in a state of forwardness for publication.

Dr. Barker of Portland, in the District of Maine, is preparing a work for the press, on Consumption and Fever. In this work the Dr. expects to establish the efficacy of Alkalies, in the cure of Yellow Fever.

At an adjourned Meeting of the President and Fellows of the MEDICAL SOCIETY *of the State of Connecticut, held at Hartford, on the second Tuesday of May*, 1797, *at the house of* JOHN LEE;

VOTED, That in future there shall be appointed annually by the CONVENTION, one General Committee, for examination of Candidates for the practice of physic and surgery,—which Committee shall consist of five members, three of whom to be a quorum, vested with full powers to examine such Candidates as may be recommended to them for examination, from any of the County Committees, or any others:—And that the general committee, and they only, shall be vested with power to countersign and deliver to such candidates as they shall approve of, a licence from under the seal of the Society; and that every candidate so receiving a licence, shall pay the sum of ten dollars to said committee, which shall be paid over by them to the Treasurer of the Society; and also pay the committee a reasonable reward for their examination.—And that the several county committees shall be empowered only to examine and recommend to the general committee, such candidates as they may think proper—any former by-laws, usage, or custom, not comporting herewith, notwithstanding.

* See the Appendix.

Voted, That Doctors John Osborn, Eliakim Fish, Lemuel Hopkins, Mason Fitch Cogswell, and Daniel Sheldon, be the examining committee.

Voted, That the thanks of this convention be given to Doctor James Potter, for his oration delivered this day.

Voted, That Doctor Felix Pascalis Ouviere, M. D. of the city of Philadelphia, be a corresponding member of this society.

Voted, That the degree of Doctor of Medicine be conferred on Doctor Thaddeus Betts, of Norwalk.

Voted, That application be made to the General Assembly, for additions to the act incorporating the Connecticut Medical Society.

Voted, That Doctor Mason F. Cogswell be an agent to transact the business before the Assembly.

Voted, That whereas a committee appointed by the Medical Convention, convened at New-Haven in October last, were only to examine a manuscript of Doctor Samuel Stearns, called the *American Dispensatory*, and report thereon to the next convention:—But they having but partially examined it, did, by the repeated importunities of said Stearns, give him a certificate, approbating the same:—The convention not having received the report of their committee till this day, do *not undertake to recommend the aforesaid dispensatory to the public*.

Whereas Dr. Elisha Perkins, a member of this society, having obtained a patent from under the authority of the United States, for the exclusive privilege of using and vending certain *pointed Metalic Instruments*, pretending that they were an invention of his own; and also, that they possess inherent powers of curing many diseases, which is contrary to rules and regulations adopted by this society, interdicting their members the use of nostrums,—Therefore, *Voted*, That the said Elisha Perkins be expelled from the Medical Society of the State of Connecticut.

Voted, That a tax of one dollar be laid on each member of the society, to be collected before the next Convention.

Voted, That the clerks of the several County Meetings be collectors of the above tax.

Voted, That this meeting be adjourned until the first Tuesday after the second Thursday in October next—then to convene at the Coffee-House in New-Haven.

Test. DANIEL SHELDON, *Secretary*.

[*Connecticut Courant*, *June* 5, 1797.

The Agricultural Society of Connecticut are forming a collection of facts for publication, on the use of Gypsum, or Plaister of Paris, as a manure.

On the 8th of May, at the White-Plains, there was a meeting of respectable physicians of the county of Westchester, who formed themselves into a society to be known and called by the name and stile of "*The Medical Society of the County of Westchester.*" Dr. Archibald M'Donald was elected President, and Dr. Matson Smith, of New-Rochelle, Secretary. The principal views of their formation appear to be an harmonious establishment of a regular practice of physic throughout the county, and an immediate compliance with the law of the Legislature of the State made at the last session. [*New-York Mag.*

A spring has been discovered in Clinton county, state of New-York, containing very large quantities of a saline substance, supposed, from some slight trials, to consist chiefly of Sulphate of Magnesia, (Epsom's salts.) We are promised a more particular account of it shortly.

At the Medical Commencement of New-York, on the first Wednesday in May, the degree of Doctor of Physic was conferred on William Bay, and Alexander Hosack, jun.—The Inaugural Dissertations were, *on Dysentery*, by Mr. Bay; *on the Yellow Fever of* 1795, by Mr. Hosack.

At a meeting of the Society instituted for the Promotion of Agriculture, Arts and Manufactures in the state of New-York, on Thurday, January 4, 1797, the annual choice of officers for the current year was made, when the following gentlemen were elected:—

Robert R. Livingston, Esq. President.
Ezra L'Hommedieu, Esq. Vice-President.
Samuel Jones, Esq. Treasurer.
Samuel L. Mitchill, Esq. } Secretaries.
Samuel Jones, jun. Esq. }

It must be pleasing to all friends of their country to be informed, that during the conflict of opposite opinions in politics, this Institution, which embraces wider objects of benevolence than any political party whatsoever, is in friendly communication with both English and French Institutions of a similar nature. During the meetings of the present sessions, the Corporation has been favoured with correspondence from their friends in England and Scotland, France, and its distant territories in America. The Society is desirous of cultivating harmony and friendly intercourse with all persons and associations conversant in agricultural, œconomical, and handicraft matters, in every country. In particular, the members feel themselves interested in their correspondence with the merchants of Glasgow, and the Board of Agriculture of

London, the Superintendant of the National Botanical Garden of Paris, and the Society of Arts and Sciences in St. Domingo.

That illustrious character, who, after liberating his country from bondage, has guided it since the revolution to a very elevated pitch of happiness and grandeur, the President of the United States, the wise and virtuous WASHINGTON, has expressed himself with so much warmth and force, in his farewell address to the people of the United States, in favour of Agricultural Associations, that it cannot be doubted, that in every State wherein individuals combine their efforts for the promotion of husbandry and rural œconomics, the Legislature will aid their efforts, and grant their encouragement and protection. [*New-York Mag.*

Late in March was landed in New-York, from on board the ship Nancy, Captain Johnson, a fine Barbary *sheep*, being a present from Captain George Dekay, to Chancellor Livingston, President of the Society for the Promotion of Agriculture, &c. The *ewe* died at sea. But Mr. Dekay writes, that he has taken measures to procure two others. This sheep has a thick and fine fleece.

By the same vessel, and from the same patriotic gentleman, have been received samples of wheat from Algiers and Saffe, which the President of the Agricultural Society proposes to distribute so as to insure experiments of its utility.

Last year several seeds of different kinds were forwarded by Captain Dekay, from India, to the Agricultural Society, and, among others, a species of *flax*, which, upon experiment, made by the President and several members, appears to be well adapted to this country. It is an acquisition, considered only as an ornamental plant, and more so as a useful one; the staple of this flax being greatly superior to that in common use.

It is pleasing to acknowledge, in a gentleman, deeply engaged in business, so sedulous an attention to the agricultural interest of his country; and it is much to be lamented, that though the Society for the Promotion of Agriculture have addressed printed instructions on this head to the Captains of vessels sailing from New-York, which have been seconded by the recommendation of the Chamber of Commerce, yet agriculture has hitherto received little of that aid from them which they might, without expence or trouble, afford.

To Mr. Dorhman and Mr. Neilson, the public are also indebted for the introduction of sheep from Holland and Ireland. [*Ib.*

The Agricultural Society of New-York, have directed their Committee of Publication, to prepare a *third part* of the *first volume* for the press.

Thermometrical Observations at Poughkeepsie.

1797. Jan. 4	7 o'clock A. M. the Thermometer stood at	11	below	0
8.	do. do.	11	do.	0
	At sun-down	4	do.	0
	9 o'clock P. M.	10	do.	0
	12 do. do.	13	do.	0
9.	7 o'clock A. M.	14	do.	0
	11 do. P. M.	14	do.	0
10.	7 o'clock A. M.	19	do.	0

This has been the coldest morning possibly ever known in this latitude. It certainly was colder by 7 degrees than has been measured in this place by a Thermometer within 20 years.

Nine-Partners, January 10, 1797.

The mercury in my Thermometer, (Fahrenheit's scale) stood as follows:

The day before yesterday at sun-rise, 14 degrees below 0, 1 P. M. 3 above do. 9 P. M. 18 below do.

Yesterday at sun-rise, 16 below do. This morning at sun-rise, 20 below do.

Which are the coldest days we have had this winter, and greater degrees than are rarely to be found in this country.

S. RICKITSON.

[*New-York Mag.*

The College of Physicians of Philadelphia have elected the following gentlemen officers for the ensuing year, viz.

Doctor John Redman, *President.*

Doctor William Shippen, *Vice-President.*

Doctors Adam Kuhn, Samuel Duffield, Thomas Parke, Caspar Wistar, *Censors.*

Doctor Thomas C. James, *Secretary.*

Doctor Benjamin Say, *Treasurer.*

[*Brown's Philadelphia Gazette, July* 5.

At the annual election of officers for the American Philosophical Society, held at Philadelphia, on the 6th of January, the following gentlemen were chosen for the current year:—Thomas Jefferson, President.—Dr. Caspar Wistar, Dr. Benjamin Rush, Rev. Dr. Nicholas Collin, Vice-Presidents.—William Barton, John Bleakley, Rev. Dr. Samuel Magaw, Jonathan Williams, Secretaries.—Charles W. Peale, Dr. Benjamin S. Barton, Robert Patterson, Curators.—John Vaughan, Treasurer.—Andrew Ellicot, Tench Coxe, Rev. J. Abbercrombie, Richard P. Smith, Counsellors for three years.

In addition to the foregoing, the following gentlemen are Counsellors of the Society, viz. Until January 1799, Rev. Dr. Robert Blackwell, Thomas M'Kean, LL. D. Rev. James Davidson, Dr. Adam Kuhn.—Until January 1798, Jonathan B. Smith, Dr. William Currie, Rev. Dr. William Smith, Rev. Dr. William White. [*New-York Mag.*

The Philosophical Society have a fourth volume of their Transactions in the press.

At a public commencement, held on Friday, May 12th, 1797, at the University of Pennsylvania, the degree of Doctor of Medicine was conferred on the following gentlemen, who submitted Inaugural Dissertations to the examination of the Medical Faculty, on the following subjects:

Mr. Joseph Johnson, of Charleston, South-Carolina, *An Experimental Inquiry into the Properties of Carbonic Acid Gas, or Fixed Air; its Mode of Operation, Use in Diseases, and most effectual Method of relieving Animals affected by it.*

Mr. Benjamin De Witt, of New-York, *An Explanation of the Effects of Oxygene, or the Base of Vital Air, on the Human Body.*

Mr. James Walker, of Virginia, *An Inquiry into the Causes of Sterility in both Sexes, with its Method of Cure.*

Mr. Robert Black, of Pennsylvania, *On Fractures.*

Mr. Goodridge Wilson, of Virginia, *On Absorption.*

Mr. Samuel Jones, of Philadelphia, *On Hydrocele.*

Mr. William Allison, of Georgetown, South-Carolina, *On Dropsy, or the Hydropic State of Fever.*

Mr. John Edmond Stock, of Gloucestershire, England, *On the Effects of Cold upon the Human Body.*

Mr. James Fisher, of Delaware, *On that Grade of the Intestinal State of Fever known by the name of Dysentery.*

Mr. Colin Mackenzie, of Baltimore, *On the Dysentery.*

Mr. Francis K. Huger, of South-Carolina, *On Gangrene and Mortification.*

Mr. Edward North, of South-Carolina, *On the Rheumatic State of Fever.*

Mr. Samuel Cooper, of Philadelphia, *On the Properties and Effects of the Datura Stramonium, and on its Use in Medicine.*

Mr. John Church, of Philadelphia, *On Camphor.* And,

Mr. John Laws, of Delaware, *On the Rationale of the Operation of Opium on the Animal Œconomy, with Observations on its Use in Disease.*

An adjourned meeting of the Medical Society of the State of Delaware was held at Wilmington, on Monday, the 19th of June, 1797; when the following officers were elected.

James Tilton, President.
Joshua Clayton, Vice-President.
George Monro, Joseph Hall, Elijah Barratt, Joseph Capelle, Censors.
John Laws, Secretary.
James Sykes, Treasurer.

It will be remembered by many of our readers, that this Society, in the year 1792, published a program, in which was proposed, as a subject of prize-dissertation, the following question:

Quænam sit Potentia Nocens, ejusque origo atque natura, unde, in regionibus calidis, iisdemque humidis, Intermittentes oriuntur Febres, Remittentes etiam, variaque alia mala, quæ, æstatis et autumni tempore, grassari solent? Qua ratione hoc cœli vitium corrigi possit? Quo pacto, quibusque auxiliis istius modi morbi arceri atque tractari debeant?

The usual conditions of prize dissertations were annexed.

Within the limited time, no dissertation, deemed worthy of the prize, was received. We understand, however, that the Society, conceiving the question of great importance, intend to renew their offer of it to the public for a still longer period, with the same prize of three hundred dollars.

Extract of a letter, dated June 22, 1797, from Dr. Wilkins, of Baltimore, to Mr. Smith.

"Dr. Archer, near this place, has discovered the Rad. Seneka, "in strong decoction, to be an almost infallible remedy in the "*Croup*, or *Suffocativ Stridula*."

The President of the Agricultural Society of the State of South-Carolina, has received from Mr. Jefferson, Vice-President of the United States, upwards of one hundred different kinds of *Rice*, which have been procured by that gentleman from the Philippine Islands. We understand that several members of the society have taken some of each sample to plant. Their experiments will determine whether either of the species ought to be introduced into this country. Some of the samples are of rice which grows on high land. [*New-York Mag.*

FOREIGN.

THE Annals of Chemistry—*Annales de Chimie*—which have been discontinued for some years, have lately been revived in Paris. M. M. Guyton, *(Morveau)* Monge, Berthollet, Fourcroy, Adet, Hassenfrazt, Séguin, Vauquelin and Pelletier, in their address to the public, inform that the Annals will appear, as heretofore, in twelve numbers annually; each of which will contain from

seven to eight sheets octavo; and will be published monthly. They purpose to re-commence with the 21st volume, and to complete the Series, which left off with the 18th volume, by publishing a 19th and 20th, to consist of the most interesting experiments, discoveries, &c. that have been made between September 1795, and January 1797.

Subscriptions are received by Moreau de Saint Mery, at Philadelphia.

A Treatise on the Scurvy has been lately published in Great-Britain, by Mr. D. Patterson, a surgeon in the navy, chiefly for the purpose of recommending a new medicine in the treatment of that disease. This is a solution of four ounces of nitre in a quart of vinegar, of which, from half an ounce to two ounces, may be administered twice, thrice, or oftener in a day, according to circumstances. The same solution, he says, may be applied to scorbutic eruptions and ulcers, with advantage.—Mr. Patterson appears to have been remarkably successful by means of this medicine in the cure of scurvy. Further and more extensive trials seem necessary, to fully establish the efficacy of the *acetum nitrosum*, as it is called; but our readers will readily conceive how extensive it may become in its application, if future experience should verify the eulogies of the inventor.

Dr. Girtanner, of Göttingen, has been induced, by the publications of Dr. Beddoes, to make trial of carbonic acid gas, in the cure of consumptions. His trials prove it to be of great service in some cases, sometimes useless, and sometimes hurtful. More precise experiments are wanting to determine in what particular circumstances it shall do good and hurt.—Dr. Girtanner is prosecuting experimental inquiries into the effects of hydrogene and azotic gases, with greater prospect of success in similar cases.

Dr. Beddoes has now completed his series of publications, intituled, "Considerations on the Medicinal Use and Production of "Factitious Airs."—This valuable work abounds with the most interesting information to mankind in general, as well as to physicians in particular, whom it seems to arm with new weapons wherewith to encounter disease. Experiments already made sufficiently attest the great power and efficacy of various Factitious Airs in the cure and alleviation of different diseases; and we are led to believe, that the *Pneumatic Institution*, under the direction of Dr. Beddoes, will not fail to determine, with scrupulous accuracy, the peculiar situations to which each species of Air may be most successfully applied.

Dr. Duncan, of Edinburgh, who has for many years supported, with reputation, the Medical Commentaries, agreeable to the intention exprest in the 20th volume of that publication, has discontinued it; and having connected himself with his son, Dr. Duncan, jun. has lately published the first volume of the *Annals of Medicine*, on a plan nearly the same. To this work we are indebted for the following articles of intelligence.——

We are happy to find, that considerable progress has been made in the *Pneumatic Institution* projected by Dr. Beddoes, at Bristol. Several hundred pounds more have lately been subscribed; and we are informed, on good authority, that the proposer has now little doubt but that it will soon be set on foot in a proper way. Still, however, fresh contributions are desirable, as it would be much to be lamented, if an attempt to solve the problem of the action of differently modified atmospheres on the human body, in different morbid conditions, should be left imperfect for want of an inconsiderable sum of money.

Dr. Beddoes, we are told, soon intends to circulate the Outlines of a Plan for the execution of this design. In that paper, he will solicit the suggestions of medical and philosophical men, in order that, by a comparison of ideas, he may be enabled to dispose of the contributions to the greatest advantage, for promoting the knowledge of physiology and pathology.

Dr. Withering, of Birmingham, in a letter to Dr. Duncan, has the following observations with respect to pneumatic medicine: "With us, pneumatic medicine is advancing; and I think enough has been done to authorise me to say, that a cure of consumption is yet to be sought for. Hydrocarbonate and oxygene are the two airs that have mostly been used; and these should be diluted with eighteen or twenty times the bulk of atmospheric air. The former weakens the stroke of the pulse, occasions vertigo, and sometimes excites nausea. It produces a disposition to sleep, abates the cough, and eases the respiration in some asthmatic affections; but in active hemoptoe, it effects a cure more speedily, and more pleasantly, than I have seen done by any other means. Oxygene, on the contrary, excites the action of the arterial system, warms the extremities, and seems to invigorate the vital principle, without exhausting it. From these last circumstances you will at once conceive it applicable to a very extensive class of diseases. I have lately used it with advantage in two cases of Melancholy; and I have seen it remove the Paralysis of Lead, which had been treated to little purpose, by the other more usual means."

Mr. George Kellie, surgeon to his Majesty's ship the Iris, who has already communicated to the public, in the 19th volume of the Medical Commentaries, some interesting facts, respecting the effects of compression by the Tourniquet, in stopping the cold fit of intermittents, has since that continued to bestow particular attention to this subject: and an account of his experiments, and observations respecting it, will probably soon be published.

Mr. John Bell, surgeon in Edinburgh, who some time ago published a volume on the anatomy of the bones, muscles, and joints, has now made such progress in the prosecution of this work, that a second volume, containing the anatomy of the heart and blood-vessels, will be published in a short time.

Dr. Duncan, junior, has for some time been employed in preparing for the press a translation of the History of Medicine, by Kurt Sprengel, a work interesting to the philosopher and historian, as well as to the physician. In order to write a history of our science with advantage, it was necessary to collect, and bring under the most proper points of view, the facts which are scattered in a thousand works; to read the writers of each age and nation in the original; to enter into the spirit of the times when they wrote; and to study the history of society, and the sciences, wherever they were connected with medicine. All this Professor Sprengel has been able to accomplish; nor has he ever availed himself of the labours of his predecessors; but, with the most indefatigable zeal, derived his knowledge from the original sources.

Dr. Girtanner has long employed himself in analysing some bodies hitherto considered as simple, and thinks he has obtained the following results.

1. Phosphorus consists of azote and hydrogene, like ammoniac.
2. The fixed alkalis consist of carbone and azote, soda containing more azote, pot-ash more carbone.
3. Sulphur consists of carbone and hydrogene.
4. The fluoric acid has a compound, probably triple, base.
5. Arsenic seems to consist of carbone, azote, and hydrogene.

The proofs of these assertions are soon to be published at length in Gren's Journal of Natural Philosophy.

DEATH.

At Hanover, 7th October, 1795, John George Zimmerman, author of the works on Dysentery, Solitude, and Experience in Physic, by birth a Swiss. The highest degree of medical, literary,

and personal merits concurred in giving to this physician a more extended celebrity than perhaps to any of his profession during the present age. His works will remain an everlasting proof of his philosophic spirit, after the recollection of the amiableness of his manners has descended with his friends to the grave. The adage, "*Minuit præsentia famam*," unfortunately so often verified, was with regard to him reversed. Melancholy, the effect of too severe study, and a painful chronic disease, long prevented him from fully enjoying the respect paid him by Princes, and the fruits of his well-earned fame.

APPENDIX.

DOMESTIC.

TO THE EDITOR OF THE MINERVA.

Staten-Island, August 1st, 1796.

SIR,

REPORTS of an alarming nature having spread through the country relative to the sickly state of New-York, I was led to inquire, by letter, how far those reports deserved credit; to which the following is an answer, and by which, at my request, the author has consented should be made public.

RICHARD CHANNING MOORE.

New-York, July 20th, 1796.

SIR,

IT is true that a fever resembling the one which proved so great a scourge to our city the last year, made its appearance about Whitehall, and in the vicinity of the Exchange, early in this month; but fortunately for us, from a concurrence of happy events, the fever has entirely subsided. It had continued but a short time only, when it pleased a Gracious Providence to send us hard winds, repeated thunder and lightning, inundations of rain, and cool weather. To these causes I think we may ascribe the suspension of a formidable disease which had began to shew itself among us. And should it return again, I have solid reasons to believe that it will not be extended beyond certain limits.

You may recollect that in the frequent conversations we have had on the subject of the last year's fever, I have been uniform in my opinion, as to the causes of its production, namely, the accumulation of every species of filth and perishable matter, on the low, new made grounds on the south side of the city, and the abominable custom of filling up the slips and docks with similar materials: I have said that such causes, aided by a moist atmosphere and a hot sun, would not fail of producing the most baneful exhalations, and that their effects must necessarily be felt by those who are more immediately exposed to their influence.

The proprietors of the lots on the east side of Whitehall-slip carried out a bulk-head the last spring, with a view to extend the dock further into the river. The dimensions of the dock are very

considerable; and a maxim invariably adopted by the owners of the dock, is, that the cheapest mode of filling up is the best: accordingly carts were employed to collect such dirt and filth as all large and populous cities furnish in abundance; and with materials of this description was the dock filled up, and to give greater salubrity to the mass, there were occasionally added, dead horses, dogs, cats, hogs, &c. &c.

The exposure of Whitehall, and indeed the whole of the west end of the city, must be considered as naturally extremely healthy: The winds, during the warm season, are commonly from the sea, and arrive at this part of the town uncontaminated by passing over any unwholesome grounds. Yet such is the fact, that the poisonous exhalations which have abounded in that quarter, during the warm weather in the beginning of this month, had so changed the air, that the inhabitants on the south side of Pearl-street, between the Old-slip and Whitehall, almost all concur in their testimony, that the disagreeable effluvia have frequently obliged them, especially in the evening, to close the windows on the south side of their houses; and in several instances gentlemen have assured us, that the offensive smell has been such as to occasion vomitings.

The wharf on which Mr. Delafield's stores are erected, is in a state truly execrable, and the slips on the right and on the left, are in a condition little better. These, and such places, are visited by the *Dock* Fever—the Yellow Fever if you please,—that murderer of our own creating. Were the proprietors of these, and such like docks, compelled to live in their vicinity, the evil would soon be remedied; but people of this description are generally secure from the ravages of disease, in the cooler retirements of the country.

The present exertions of the common council, in giving a new surface of wholesome earth to the dock at Whitehall, will, no doubt, be productive of the greatest advantages to the inhabitants of that part of the city; and if the same measures were extended to other parts of the town, there would be much less reason to apprehend a return of the dock fever.

Thus, Sir, your questions are answered; you *might* have come to town with safety; you *may* come to town with safety. New-York, as I have said before, may be rendered as healthy a city as any under the sun—and when a more rigid police prevails, and the nuisances with which this city abound are corrected, you will hear no more of the ravages of particular diseases.

I am, Sir, &c.

RICHARD BAYLEY.

To the Rev.
RICHARD CHANNING MOORE.

LETTER FROM Dr. BAYLEY TO THE GOVERNOR.

New-York, November 28, 1796.

SIR,

THE desire which your Excellency has expressed to see the causes of the late Malignant Fever investigated, has induced me to submit to your perusal the enclosed narrative.

I have the honour to be, most respectfully, &c. &c.

R. BAYLEY.

BEFORE I undertake to account for the origin of the Fever which made its appearance in this city, in June last, I must be permitted to revert to certain facts and opinions contained in a work which I furnished to the public on the subject of a similar Fever, which prevailed more generally in this city, during part of the summer and autumn of 1795.

In that publication it was stated, that the Fever was first observed in the neighbourhood of Fitch's wharf, in Water-street, and that it gradually extended from thence in different ways, but more particularly in the direction of the prevailing winds.

Near where the fever first began, there were several unfinished docks, which had been receptacles for several years of every kind of filth and dirt.—There was also a considerable surface of new made ground in the neighbourhood, in a very unfinished state, upon which dirt, collected from the streets, was frequently thrown; likewise several store-houses erected on piles; and, added to these, a neglected and filthy state of the wharves.

This representation, as it regards the then condition of the docks in that part of the town, is confirmed by the letter of Mr. Fitch, an extract of which is given in the publication above alluded to, and which, as it is much to our purpose, I shall again introduce —His words are: "Although the docks in the vicinity of the store which I occupy, may be less offensive than in many other parts of the city, yet many of them are in a very exceptionable situation. The ponding of water by running a bulk head across an unfinished dock, and leaving the vacancy, for several years, to be filled up with every species of filth and perishable matter, is an object worthy the attention of the police. The situation of the grounds between Water-street and Cherry-street, is rendered very noxious by Water-street being raised above a certain level, and thus preventing those grounds from being drained. The effect of such nuisances on the health of the inhabitants of a crowded part of the city cannot be imaginary."

Those who have perused that publication, will find a number of reasons assigned why the inhabitants of the south-east part of the

city would be particularly liable to fever, during the hot months of the year. This opinion was warranted in the first place from matter of fact, as the Bilious Fever had appeared in that quarter, for several years successively; and, in the second place, as a matter of reasoning, from the relative situation and exposure of that part of the city; but fortunately the south-east part of the city had been more healthy this year than for several years past—and the causes of fever seem to have been transferred into a part of the town, hitherto reputed little liable to particular sickness.

In investigating the causes of this change, a recourse to facts only will afford a sufficient explanation.

First.—The docks spoken of in the south-eastern part of the city, which were in so loathsome a state, have been completed, and generally covered with a sufficient quantity of good earth, gravel, or sand.—The grounds have been drained, or where that was not practicable, the surface has been rendered uniform, with clean earth; the vacancies under the stores which were built on piles, have been filled up in a proper manner, and the wharves have been kept free from rubbish and filth. In short, so much care and industry have been bestowed here to remove the nuisances that so generally abounded, that where a person was before almost suffocated with intolerable stenches, one may now pass without experiencing the least offensive smell.

Secondly.—Let us see what has happened at the south-west part of the town. Between the Whitehall and Exchange slip, a new dock has been made, running, on an average, sixty feet into the river, extending 458 feet in front, and nine feet in depth. If nine square feet are calculated to be equal to a cart load, it will be found that 24,000 loads were necessary to fill up the dock, which were accumulating from July, 1795, to July, 1796. And what has been the nature of the materials employed for this purpose? It is difficult to answer the question, except in very general terms, namely, every thing subject to decay and corruption.

One third of the substance of this dock may be computed to be lodged above the ordinary height of the tides; therefore, 8000 loads of these perishable materials were exposed to the action of the hot summer sun. In the month of April of this year, I had frequent occasion to visit Whitehall. The stench which already issued from the dock was highly offensive; and, on inquiry, I found that the matter which had been employed to make the new ground consisted chiefly of the dirt which had been accumulating in the streets during the winter season; and that, besides dogs, cats, hogs, &c. there had been actually two horses buried in the rubbish, which had died in the spring, in a small hovel erected on the margin of this nuisance.

Reflecting on this state of things at Whitehall, and recollecting

what had happened in another part of the city, under similar circumstances, I found my mind strongly impressed with the probable consequences; and was led from thence to converse with several individuals of the Corporation on the subject. But nothing material could be done to guard against the supposed probable mischiefs. There was a contract between the proprietors of the ground and other individuals, for filling in that dock, with which the magistracy did not think themselves authorized to interfere, unless it was declared to be a nuisance on oath, or by the presentment of the grand jury.

About the middle of June, the offensive smell arising from the new dock, and other nuisances in the neighbourhood, were very generally observed, in that quarter of the city; and their effects were manifest in many who complained of head-achs, sick stomachs, &c. &c.

The situation of the Exchange-slip, as a source of noxious exhalations, I feel myself obliged to notice, also, particularly. This slip, from its length and narrowness, from its being the receptacle of an extensive common sewer, and especially from having a great proportion of its muddy bottom exposed at low water, sends forth effluvia, which in a very sensible manner contaminate the air to a considerable distance around.

In a letter which was published in July last, I had occasion to mention the frequent disagreeable state of the air, in the south-west part of the city. It was there stated, "That the poisonous exhalations which had abounded in that quarter during the warm weather, had rendered the air so noxious, that the inhabitants on the south side of Pearl-street, between the Old-slip and Whitehall, almost all concur in their testimony, that the disagreeable effluvia have frequently obliged them, especially in the evenings, to close their windows on the south side of their houses; and, in several instances, gentlemen have assured us, that the offensive smell has been such as to occasion vomiting." These are circumstances of great moment, and are entitled to serious consideration, if they are regarded only as causes which *increase* the malignity of diseases.

In the latter part of June the fever began to shew itself about Whitehall, and in the vicinity of the Exchange. But it continued for a short time only, when the concurrence of high winds, heavy rains, much thunder and lightning, and cool weather, which happened about the middle of July, were probably the causes to which we may attribute the suspension of the disease. This at least was rendered probable, because, as soon as the weather became warm and dry again, it was accompanied by those noxious exhalations, which again produced the fever. Thus the disease appeared, went off, and came on again, according as the weather fa-

voured, or impeded the generation of those vapours which, in their operation on the human body, are the exciting cause of fever.

I must take notice, also, of some other circumstances relative to many of the houses about Whitehall; which, if they were not of themselves, in any instance, a cause of fever, must certainly be considered of a nature to aggravate the disease, when brought on by other causes—namely, the state of the ground in the rear of the houses, which, in consequence of the streets being raised, is in many places considerably below the ordinary level; and, therefore, liable to accumulate matter, which, in the process of decay, produce vapours, which render the air impure—and which, in confined situations, are often the cause of fever: also, the old and decayed state of many of the houses, and the inattention to cleanliness, which is always neglected where people of the poorer sort are much crowded together. The bedding and clothes of the sick, under these circumstances, must be supposed to become daily more and more impregnated with the exhalations arising from their bodies; and hence arises the dreadful havock made by infectious diseases in the small houses of the poor; and on such as are destitute of the means of cleanliness, and who, of necessity, are obliged to remain a length of time without changing their clothes.

The further we inquire into the sources of the fever, the greater is the analogy discovered to be between the state of things at Whitehall, and in that part of the city where the fever first appeared last year.—Accumulations of decaying animal and vegetable matter; a part of the ground below the general level; poor people crowded together in small uncleanly apartments, were circumstances so perfectly coincident, that, were particular effects to take place in one situation, we should naturally expect similar effects to take place in the other.

If the fever of last year, and that of the present year, were brought on by the same causes, it may possibly be asked, how it happened, that in the one instance it was so widely extended, and in the other confined to such narrow limits. This question admits of an easy solution. It is generally acknowledged, that epidemic diseases are either produced or widely diffused by some particular qualities of the atmosphere; and the extraordinary prevalence of heat and moisture in the air, during the summer and autumn of the last year, must still be recent in the memory of the inhabitants of this city; whilst the state of the air, during the warm season of the present year, has been much cooler and drier than usual.

Thus the fever of the last year was more generally felt, because a peculiarity of the weather predisposed the body, or rendered it more susceptible of those causes which produced the disease:—

whereas, the weather of this year occasioning no predisposition, the fever was generally confined to a situation where it required the exciting cause to be of itself sufficiently concentrated to produce its effects.

Many of the men who belonged to the market vessels which came to the Whitehall dock, sickened, from being exposed to the exhalations arising in this situation. The boatmen of the Staten-Island and Elizabeth-Town ferry-boats, suffered very generally, although many of them were so cautious as not to sleep on shore, and to avoid all communication with the sick. Several of them died of the disease.

Many transient persons from Staten-Island, who visited frequently at Mr. Catleyou's, residing at Whitehall, during their stay at New-York, sickened, and soon died. It was said, that Mr. Catleyou's family were sick with the Yellow Fever; but this report was not well-founded. The family were not well during any part of the warm weather, but none of them had the Bilious Fever. Their complaints were such as are commonly the consequence of living in foul air, viz. sick stomachs, and head-achs, attended with considerable lassitude.

The above facts respecting transient persons taking the fever, are confirmed by Dr. Clark, of Elizabeth-Town, New-Jersey, who, in a letter with which he has favoured me, observes, that "in many instances of the disease among the ferry-men, who resided chief of the time at Whitehall; or among other persons "who slept there—and all had taken their passage from Whitehall "dock, within twelve days of the attack."

It is worthy of remark, also, that the disease, according to Dr. Clark, occurred in those only who had been in New-York. He writes, "that amongst the cases which came within my practice, "and from the best information of others, there was no instance "of the disease taking place in any, except those who had been at "New-York, and particularly at Whitehall."

Dr. Clarke states further, "that there was no instance of the "fever amongst the nurses, or attendants upon the sick." This fact is confirmative of the opinion which we have always endeavoured to support, that the fever in question is not a contagious disease.

The operation of local causes in producing diseases is well exemplified in the account of the Remitting and Intermitting Fevers of the West-Indies, given us by Dr. Hume; "and while," says he, "the hospital remained there (at Port-Royal) the sick were seldom seized with complaints of this kind."

"When another hospital was built on the opposite side, though only at the distance of four miles, not one man in an hundred escaped these fevers, who were sent to the hospital, and remained

in it three or four weeks: and even the marine guard who were relieved once a fortnight, or three weeks, fared no better."

Dr. Hume describes the situation of this hospital to be in the neighbourhood of stagnant water marshes. He then adds, "it was the damp winds, filled with the putrid exhalations, which occasioned the frequency of remitting, or Yellow Fever, and intermitting disorders of this place. At my request, this hospital was deserted, although in all other respects it was good, and had cost near fifty thousand pounds sterling."

Several plantations near this hospital were unhealthy from the same cause.

It would be endless to quote authorities upon this subject: nor is it necessary to look to a distance for them. What has happened within our own state abundantly confirms the fact, as may be seen from Dr. Williams's letter, inserted in my publication upon the fever of the last year.

I do not think it necessary to be more particular in reciting facts, or in detailing these circumstances which, in my mind, are fully competent to explain the origin of the fever which has excited so much alarm, and proved so great a scourge to the citizens of New-York. It is the less necessary, because I mean to shew by the following documents, that the disease was not, as many have insinuated, nay, positively declared, brought here from abroad—And if we can advance sufficient testimony to invalidate that opinion, the conclusion necessarily follows, that the fever was occasioned by causes of a domestic nature; and, therefore, the fact we are solicitous to establish, receives that degree of probability which, in matters of this kind, gives an assurance equal to demonstration.

I shall then, in the next place, bring forward what appertains to the vessels supposed to have introduced the Yellow Fever in New-York.

The first suspected vessel was the ship Antoinette. On the 25th of May, the ship Antoinette arrived in this harbour from Brest, in ballast, and anchored in the North-river. Two days after her arrival, I was requested to visit sick on board. The commander of the vessel assured me, that the men had not been confined, nor did he think their indisposition such as to render it necessary they should be sent to the hospital; one of the men was then at work upon deck, and the other came from below immediately on being called; as, however, the ship was to be brought to a dock, it was thought expedient that these men should be sent to the hospital.

That these men had not complaints of an infectious nature shall not rest on my assertion alone. The opinion and declaration of Dr. M'Farlane, under whose care they were placed, will carry with them much stronger evidence.

October 20, 1796.

SIR,

I HAVE just received a few lines from you, wherein you request me to declare my opinion respecting the nature of the complaints of the two patients from on board the ship Antoinette, who were sent to Bellevue Hospital, and placed under my care.

I do not at present recollect the names of those people, as I did not note the histories of their complaints. Their cases, however, have not escaped my memory.—The one complained of a pain in his breast, attended with cough and difficulty of breathing. His strength was considerably impaired; the complaint, which he attributed to cold, having been of some duration. By the application of a blister to the sternum, and the continued use of expectorants, he was discharged, as cured from the hospital.

The other laboured under a complaint, *hernia hermoralis*. By the use of mercurial frictures, saturnine applications, the suspensory bandage, &c. he was relieved, and discharged as such, by his own request. I am, Sir, &c.

JOHN M'FARLANE.

To Dr. R. BAYLEY, *Health-Officer*.

On the 29th of May the Antoinette hauled to the dock at Whitehall. In this situation the crew could not come on shore, nor return on board, without passing over the new made ground; and thus were the men exposed to the exhalations which arose from it, whilst in the ship, and occasionally in a greater degree, by their visits on shore. During the month of June most of the men of the Antoinette complained of an unusual weakness; and in the beginning of July, several of them were attacked with fever.

Two of these cases terminated in black vomit and death.

The cause of the sickness on board of the Antoinette being no longer a subject of conjecture, the remedy became obvious; namely, the removal of the vessel to a more healthy situation; and as the ship had laid more than a month at the Whitehall dock, it must be supposed, that the air beneath her decks had become completely saturated with the noxious vapour arising from that mass of decaying materials, of which the dock was composed.

It was deemed necessary, therefore, to have recourse to the measures commonly employed to purify vessels. For this purpose the Antoinette was hauled out in the stream, and after the process of purification was over, she was directed into the north-river to take in her cargo. After this period the men on board her remained in good health, except Captain Hendricks, who had the ague and fever.

Now, as the men who were complaining at the time of the arrival of the Antoinette were not sick with fever, of which Dr. M'Far-

lane's letter is sufficient evidence, and as the fever did not appear among the crew until five weeks after she had been at the Whitehall dock, and more than ten days after it had appeared on shore, it must acquire more than an ordinary share of prepossession in any one to believe, that the Antoinette had any agency in the origin of the fever at Whitehall.

On the 29th July the brig Patty arrived at this port. After she had left this place, a report was circulated, and by many credited, that this vessel had introduced a malignant fever in this city. Although, on this subject, I had no doubt, as I had taken a manifest of the healthful situation of the brig Patty, and the crew had undergone my personal examination, yet I was anxious that every suspicion should, as far as possible, be removed from the minds of the citizens; I was, therefore, induced to write to the commander of the brig Patty, who was then at Boston, to request that he would give me an attested statement of facts, respecting such sickness as might have existed on board the brig during her voyage, and the condition of the health of her crew at her arrival in this port; whether she had any fever on board after that period, or whether any person had sickened in Boston after her arrival there, who had had communication with her. To these inquiries I shortly after received the following attested certificate:—

"*This is to certify, that during my voyage in the brig Patty, from Boston to the West-Indies, and back to New-York, none of my crew were sick of a malignant fever; and that, on my arrival in New-York, all my crew were in good health, except my mate, who was sick with the ague and fever, and who was taken out of my vessel, and put on board a packet to be sent home to Trenton; and since my arrival in Boston, my crew has remained in perfect health as before; nor has any person who has been on board the brig Patty, received any, or been apprehensive of any disorder whatever.*

"JOHN SNOW.

"*August* 3, 1796."

The above statement of Captain Snow is so clear, and conclusive, that still to entertain any doubt would imply a mind disposed to contemn truth, even under the serious garb of a sacred oath.

Thus, then, have I taken a cursory view of the circumstances relative to the origin of the Yellow Fever. In reviewing the situation of that part of the city, we have found abundant reason for believing, that the fever was produced by causes of a local nature, and originating there.

The importance of this fact renders me extremely solicitous, that the truth of it should be generally established, and strongly impressed upon every mind; for if measures are to be pursued, calcu-

lated to prevent the calamity in future, the extent and adequateness of those measures must depend upon this conviction.

It is to be hoped, that we may not deceive ourselves, by a mode of reasoning adopted by some, which, however plausible it may appear at the first view, must certainly prove fallacious upon examination. It is urged, that the city of New-York has remained for many years exempt from any particularly fatal diseases; and we have no greater reason now to suppose ourselves more liable to sickness than formerly; and that if diseases of a malignant kind should at any time prevail among us, we ought to look to some foreign source for their origin. The answer to this argument is, that the state of things are every day changing. The city is extending its dimensions; the houses are becoming more compact, and crowded together; the inhabitants are increasing in number; and more especially the mode of making *new ground*, which renders a considerable part of the city a *low level*, are changes which place us in a situation different from any previous period.

This kind of calculation, it is to be feared, is not by many entered into; but it is one which is entitled to serious consideration, in as much as it takes in those circumstances which have a particular influence upon the health of the inhabitants of the city of New-York.

Before I conclude I must take the liberty of mentioning to your Excellency, what has hitherto been the condition of the hospital lately established upon Bedlow's Island. I am induced to do this, in order that the inconveniences under which it has laboured, may be rendered apparent, and from a hope that measures will, in consequence, be taken to provide for the hospital, in such manner as may be necessary to complete the establishment, and give it extensive utility.

The necessary alterations and repairs which the buildings on Bedlow's Island required, to render them fit to receive the sick, were not completed till the middle of August.

As soon as these were done, application was made to the commissioners of health, for a supply of necessaries to accommodate the sick, who, at this period, were sent to the hospital, from Whitehall, and from several vessels just arrived from sea. The commissioners directed the beds and bedding which had been used the year before at Bellevue to be sent to the new hospital on Bedlow's Island; but, unfortunately, those articles were in a very filthy state: but as the sick were already at the hospital, we have had no alternative but to select the cleanest of those articles and use them in that state. The hospital also was unprovided with wearing apparel, than which nothing is more necessary, as well for the comfort of the sick, as to prevent the introduction of infection in the hospital.—Under these circumstances, the consequen-

ces were such as might naturally be expected; for within eight days of the time when those articles were brought to the hospital, those people who had been employed in transporting the bedding from Bellevue, the nurses who attended the sick, and the steward of the house, were attacked with fever. The attending physician, Monsieur Bouvier, was also indisposed for several days.

From this distressing situation, however, the hospital was soon happily relieved by a supply of beds, bedding, and such clothes as were necessary for frequent changes; and placing the sick in a state of the greatest cleanliness. From the period that this was done, neither nurse, visitor, nor any kind of attendant were known to be attacked with fevers.

(Signed) RICHARD BAYLEY.

To Gov. JAY.

New-York, Dec. 22, 1796.

ARTICLE II.

LETTER *from Dr.* WARREN *to Mr.* ELIPHALET PEARSON, *Corresponding Secretary of the American Academy of Arts and Sciences.*

SIR,

IN the month of December last, I communicated to the public a number of facts relative to the fever which prevailed the last autumn in the town of Boston, calculated to counteract the effects of a publication in the city of Philadelphia, in which the opinions of the Physicians on the nature of the disease, and the method of practice, were grossly misrepresented.

My principal object, in what was then offered, was to establish the following propositions:

1st. That the physicians of the town were unequivocally of opinion, that the fever originated from local causes.

2dly. That, in the treatment of the disease, the stimulant plan had not been adopted in any stage of its existence.

3dly. That the depleting system, in general, had been used from the beginning. But,

4thly. That bleeding, in particular, was by no means generally practised; and that there were strong reasons for believing, in opposition to what had been asserted in the publication referred to, that, where it had been used, the effects had been unfavourable.

I had then prepared, as an elucidation of the above, the following history, which may perhaps suggest some motives for a greater degree of caution in adopting a rigid adherence to system in medical practice; and furnish the means of comparing this with other

fevers which have proved epidemic in various parts of the United States. And I now submit it (as I judged it a more proper mode of communication on a professional subject) to the candour of this Academy.

The first appearance of the disease was on the 25th of August, 1796, in a family at the south-easterly part of the town of Boston, near a considerable extent of flats, which are daily exposed, for some hours, to the action of the sun.

A lady of this family was the first victim of the disease. She was seised with rigors, a general distress throughout the whole system, with a white and moist tongue, dry skin, frequent and weak pulse; but without any very alarming appearance until the third day, when the pains, which now became more severe, with laborious respiration, a slight redness of the eyes, a sleepiness, and insensibility, followed at night by a sudden sinking and intermission of the pulse, announced the extreme hazard of her situation. Active cathartics were prescribed in the beginning, and a blister was applied over the whole anterior part of the thorax; but no benefit was derived from either, and she died at the end of the fourth day.

The next person attacked was a female of the same family. She was taken sick within twelve hours of the first, with pains in the head, back, and lower extremities; a vomiting, which continued incessant through every stage of her illness, great oppression at the breast, a weak and quick pulse, moist skin, and yellow tongue. Opium, and calomel, with other purgative medicines, were administered, without having been a moment retained in the stomach; her pulse became intermittent on the third day; and on the fourth a fatal termination ensued.

Neither of these patients had any yellowness of the skin in the course of their sickness: there were no reasons to believe they had ever been exposed to contagion—and they both imputed their illness to their having sit at an easterly window in the evening air, when heated with exercise.

On the 2d of September, a son-in-law of the above-mentioned lady was seized with a fever of the same kind; and within three days from that time, his wife and her two brothers, all of whom had been closely attendant on their deceased mother. Three of these were treated with large and repeated doses of jalap and calomel; two of the three took emetics; one of them was bathed with cold water, dashed over the whole body on the third day from the attack; and having been kept cool, they all recovered. The fourth was in a situation peculiarly unfavourable when attacked; she took such doses of jalap and calomel as were thought best adapted to her state; and on the fourth day she died.

I would here remark, that in two of these cases the symptoms were, from the first, more mild than in those which proved fatal—that they were destitute of some of the most alarming symptoms with which the others were attended—had no inflammation of the eyes, nor difficulty of respiration, but a thicker fur upon the tongue, which was of a dark colour towards the height of the disorder; with more distinct pains in the head, back and limbs, with exacerbations at night; and ran on until the eleventh day, before any remarkable change in the symptoms; after which, the recovery was slow, as in a common typhus, and was not completed until the fourth week.

The next person whom I visited with the disorder, lived at Oliver's Dock; and within two or three days from this time, I was called to five others at the south part of the town, and one in the neighbourhood of the first-mentioned family.

Between this and the 18th September, when I was called to Mr. Newell, the person whose situation excited so much apprehension in the town, I had visited about a dozen others, with somewhat similar complaints, but very different in the degree of violence with which they were attended. In the former, the skin, on about the fourth day, became yellow; on the sixth, petechiæ were discovered over all parts of the body; and a most obstinate dysentery, followed by colliquative diarrhœa, proved fatal on the eighth. In many of the latter, after slight rigors, and obtuse pain in the head, for the first twenty-four hours, together with a sense of heat or burning at the stomach—a hæmorrhage from the nose often took place, and continued to be a troublesome circumstance for several days, without any remarkable mitigation of the symptoms.

In these, spontaneous vomitings rarely occurred—but when they did, large quantities of bile were thrown up from the stomach, and emetics, or cathartics, invariably produced the same effect. The pulse was generally small and irregular—The tongue coated with a saburra of a yellowish cast; and the excretions from the kidneys were often turbid during the augmentation of the disease, highly tinged with bile, and sometimes depositing a copious sediment, before any thing like a crisis had been discovered in the patient.

The crises were seldom very sensible or perfect; and when present, were commonly most conspicuous in the excretions of the skin; and the above was the usual form in which the disease afterwards continued to appear, with now and then an instance, in which it approached more nearly to that in which it commenced.

In the first stage, emetics were sometimes strongly indicated from the incessant nausea, which prevented any medicine from resting on the stomach—but generally, a dose of from 10 to 15 grains of calo-

mel, even under this circumstance, often answered a better purpose by discharging very copiously a bilious matter from the stomach, as well as intestines; and by frequent repetition, effected the cure. Antimonials were sometimes given between the doses—blisters were occasionally applied—the drinks were principally acid; and wine was forbidden.

The disease, however, unless conquered by a very early exhibition of this medicine, often ran on to about the 11th day, and sometimes to the end of the third week; and in no instance, after the case of Mr. Newell, did it prove fatal within that period.

In three patients whom I visited, the cold bath was used in the hottest stage of the fever, to very great advantage. In two cases only, what is called the black vomit, took place. From the beginning of September the fever was slowly increasing; and I find that the number of patients, at any one time under my care, was greatest in the first week of October; from which time it gradually declined, until about the middle of December, when, I believe, it had altogether disappeared.

A very great proportion of those taken sick were situated near extensive flats, particularly about the easterly, southerly, and westerly skirts of the town. The place called Oliver's Dock, where the disease was most prevalent, was exposed to exhalations from foul substances, lodged about the wharves and docks of that quarter, with buildings so constructed as to admit of but very imperfect ventilation, and with large numbers of inhabitants crowded together in a small space.

When the disease first made its appearance the weather was warm; in about the middle of September it became cool; plentiful rains having previously fallen; and as the cool weather advanced, its violence and mortality were gradually diminished.*

In most families where one person had been sick, others were soon taken down of the disorder;—in some, almost every adult person became ill; the children generally escaping. I knew of no instance of any black person being infected.

The disease, as far as I could discover, was as often contracted from those who had it lightly, as from those who had it in a more dangerous degree. In several families where one had died, no other person received any infection; in others, one had it lightly, and several others contracted it from him; some of them in the milder form, and some in the more severe.

The mortality of the disease was by no means great; of fifty-two persons whom I attended, nine died; two of these, in consequence of circumstances foreign from the disease; of the number, two were children, five were women, and two were men.

* Herein it seems to differ from what has been remarked with respect to Typhus, which has been found to increase as cool weather advanced.

From the best information I can obtain, not above thirty persons died of it in the whole season;—several persons were buried in the night, and this having excited a great degree of alarm in the country, served as a foundation for the most exaggerated accounts of the mortality with which it was attended.

The town was remarkably free from other disorders through the whole of the autumn;—no dysenteries prevailed in it, and few of the usual diseases of children.

Whether there is any essential difference between the fevers denominated *bilious*, or whether they vary only in degree, according to circumstances under which they are produced, I shall not presume to decide.

Dr. John Hunter seems to have held the latter opinion, and it is not improbable, that the same disease may have its symptoms and periods, so much under the influence of exterior causes, as at times to bear some of the appearances of one belonging to a different class of disorders. However this may be, there seems clearly to be a great difference in degree at least, between that which has been above described, and the Philadelphia fever of 1793. Having, almost every fall, seen a considerable number of cases very similar to the above, not excepting the black vomit, nor the yellow skin, together with the quality of contagion, and other circumstances usually attendant on fevers of this denomination, I have been induced to believe, that the disorder in question was no other than what has more or less prevailed here almost every year, and is what is properly termed, a Bilious Remittent Fever.

That it originated from noxious substances, exhaled into the atmosphere from putrifying animal or vegetable matter, or both, is extremely probable from the places in which it was most prevalent,* and that a confined situation, or filthy state of the streets, alleys, and by-places of the town, will, as it becomes more populous, rents higher, and consequently the poor more closely crowded together, further expose us to the danger of such diseases, is a serious truth, which may, perhaps, in some future day, be too fatally evinced. And it may not be improper here to remark, what is too seldom attended to, that nothing can contribute so much to individual preservation, as personal cleanliness, and by frequent bathing, removing impurities from the skin, and promoting a free perspiration.

* It has been generally thought, that continued fevers are the offspring only of human effluvia, and intermittent, of marsh-miasmata; yet there is sufficient reason, from some recent instances of those diseases, for believing, that this limitation does by no means generally prevail.

Animal substances, of which many are to be found in these places, intermixed with vegetable, are said to putrify when exposed to the sun, more quickly after having been covered with salt than with fresh water.

In case of actual infection, the sick should invariably be separated from the well—the rooms cleansed, and the clothes washed or destroyed.*

The success of Dr. Rush's prescription of the jalap and calomel might perhaps be considered as a proof of the affinity of this fever to that of Philadelphia; but if the success of the latter medicine, in the malignant species of throat distemper, has been established, as has been affirmed, it will appear the less extraordinary, that it should succeed in this disease, even on the supposition of its being of a putrid nature.

If, in the common Bilious Remittent Fever, it appears that the use of active cathartics, and particularly large doses of jalap and calomel, produce the most salutary effects, it will be an additional satisfaction to that benevolent man to find a part of his treatment of the Yellow Fever extended to diseases in which he had not perhaps contemplated its efficacy.

JOHN WARREN.

* Dr. J. C. Smyth, in a report to the Lords Commissioners of the Admiralty of Great-Britain, of the last year, endeavours to establish, on the foundation of experiment, the advantage of fumigation with the vitriolic and nitrous acids, for cleansing infected clothes and buildings. He prepared an earthen vessel, containing sand heated in an iron pot; and having placed in it a tea-cup with half an ounce of highly concentrated vitriolic acid, after it had acquired a proper degree of heat, poured into it gradually, an equal quantity of nitre in powder; this was stirred with a glass spatula, and carried through the wards of the sick. It at first excited a slight cough among the patients, which soon subsided, and the air was in an astonishing degree sweetened by the process. He cautions against using metallic vessels, as the fumes might, in that case, prove injurious.

Dr. Trotter, in his Medicina Nautica, a very late publication, scruples the efficacy of this method; but there is reason to hope it may prove a valuable discovery.

It is to be remarked, that all cloathing of animal matter, such as woollen and silk, being more subject to decomposition, is one of the most dangerous sources of infection; and, therefore, the utmost care is required in purifying them.

FOREIGN.

ARTICLE I.

Account of the Effects of the NITROUS ACID *on the Human Body. By Mr.* William Scott, *Surgeon in the Service of the East-India Company. First published in the Bombay Courier of April* 30, 1796.

THE following attempt to extend a little the limits of the healing art, is inscribed as a tribute of respect to the character of Dr. James Anderson, Physician-general at Madras.

In August, 1793, I employed myself for some time in making experiments on the bile, a secretion that is connected in a great degree with many of the diseases of this country. I wished to unite some of the calces of mercury with the resinous matter of that fluid; for I imagined that I might discover some chemical affinity between those substances, and be able to see by what means this metal is so singularly qualified for removing obstructions* of the liver.

I had collected, for experiment, a quantity of the resinous base of the bile of a buffalo, which I had separated very carefully from its soda, and from the lymphatic matter with which it is united. I had put a drum or more of this substance into a vessel, to which I added about half of the same weight of the red calx of mercury, with ten or twelve ounces of water. On heating the whole together, I was surprised to observe, that the base of the bile became remarkably more soluble in the water. I cannot say that I observed the red colour of the calx in any great degree altered; but it is known to retain its brilliancy with different quantities of oxygene.† I filtrated this bitter solution, which deposited the base of the bile, as the water evaporated in the ordinary heat of the atmosphere. I shall, at another time, consider this subject with a little more attention.

M. Fourcroy has observed, that water dissolves a small portion of the base of the bile. In this experiment, a considerably larger quantity was taken up than water could have dissolved, which I attribute to the oxygenation of the resin, by the pure air of the calx. I had some reason to think, that obstructions of the liver do often consist of a deposition of the resin of the bile, which, I now began to suppose, might be rendered soluble in the animal fluids, by the pure air of the mercurial preparations that are given for the disease. I have seen livers, on the dissection of the dead, of a pearl colour, and much enlarged, which, I suspect, were composed, in a good measure, of this resinous matter. I have even found it, from accurate trials, in a considerable quantity, in the substance of a liver that was apparently without disease. Is the well known effect of new grass, in dissolving the biliary calculi of the gall-bladder, that cattle get in the winter-time, to be accounted for from the pure air of green and ascescent vegetables?

It is acknowledged, that all the calces of mercury which are used in medicine, contain a quantity of pure air; but I know of no direct experiment having been hitherto made, to prove that the effect of mercury in diseases of the liver, or in other maladies, depends on this principle, and not on the metal itself. The experiments that

* I have used the word OBSTRUCTION to express the chronic disease of the liver, so common in this country.

† See Experiments by Van Mons on the Red Oxide of Mercury.

I had made on the base of the bile, inclined me to wish to take myself a quantity of pure air, united to some substance for which it has no great attraction. I reflected on the different ways that are employed by chemists to oxygenate inanimate matter; for I believed, that the same chemical attractions would produce a similar effect in the living body, although they might be disturbed in their operation by the vitality of the principles of which it is composed.

The nitric acid, as may be supposed, was one of the first substances that occurred to me as fit for my purpose; for it is known to contain about four parts of vital air, united to one of azote, with a certain proportion of water. These principles can be separated from each other by the intervention of many other bodies, as chemists find every day in their operations. I was led, besides, to give a preference to the nitric acid, from observing, that it dissolves very completely the resinous base of the bile. I have since found, that the celebrated M. Fourcroy had made the same observation before me.

Before I began to take the nitric acid, I consulted all the accounts of it that I could procure, with a view of learning something of its effects on the human body. The result of this inquiry was but little satisfactory; for I only found that it had been given as a diuretic, in very insignificant quantities, or recommended in general terms, where the mineral acids are supposed to be useful. I did not think myself warranted to administer it to others from such imperfect information: but I resolved to take it myself; and I thought I was particularly qualified to determine its effects, as I had reason, for a long time before, to complain of my liver.

In September, 1793, I began to take the nitric acid. I mixed about a dram of the strongest that I could procure, with a sufficient quantity of water; and I was happy to find, that I could finish that quantity in the course of a few hours, without any disagreeable effects from it. The following is the journal that I kept of myself at the time.

11th September, 1st day. Took at different times about a dram of strong nitric acid, diluted with water. Soon after drinking it, I feel a sense of a warmth in my stomach and chest; but I find no disagreeable sensation from it, nor any other material effect.

2d. I have taken to-day a considerable quantity of acid, diluted with water, as much as I could easily drink during the forenoon.

3d. I have continued the acid. I feel my gums affected from it, and they are somewhat red, and enlarged between the teeth. I slept ill; but could lie for a length of time on my left side, which, from some disease in my liver, had not been the case for many months before. I perceive a pain in the back of my head, resembling what I have commonly felt when taking mercury.

4th. My gums are a little tender. I continue the acid as before; I still find a pain in my head, and about my jaws, like what arises from mercury. I perceive no symptoms of my liver complaint.

5th. I have taken the acid; and always feel an agreeable sense of heat after drinking it. I spit more than usual.

6th. I continue the acid. I observe my mouth sorer to-day, and spit more.

7. I think I am now sufficiently oxygenated. I feel my mouth so troublesome, that I shall take no more acid.

From this time my mouth got gradually well, and I found my health considerably improved.

I now began to suppose, that I had discovered a remedy for that chronic disease of the liver, which is so much more common here than the acute hepatitis. I thought that it might in some respects be preferable to mercury, as it did not appear to produce the inconveniences that arise from the use of that metal. I have given it since to a number of people, who had taken mercury for hepatic obstructions, without being effectually cured; and I have found it in many cases produce the most agreeable consequences. If it were proper on this occasion to be more particular in detailing the cases in which I have administered this remedy, I believe I could make it very probable that I have not been deceiving myself. In the acute hepatitis, I have hardly employed it; for where the life of a person is in immediate danger, I have thought it my duty to make use of remedies that are established.

I have, with the best effect, oxygenated several people with the nitric acid, who were much reduced by tedious intermittents. That kind of fever is often connected with a diseased liver or spleen. In consequence, I think, of this remedy, I have seen them recover their natural colour from a leaden or bilious hue, and regain their strength from a long continued weakness. I believe, if given in a sufficient quantity, it would be very useful in the fever of this country, which has been called bilious, or nervous, or putrid, and for which mercury appears to be a specific.

I have met with two instances only in this country of diabetes. They were both natives, and in the decline of life. I cured them both by mercury, after many other remedies had been tried. One of these men had a relapse of his disease, which I removed a second time with the nitric acid. I thought this a satisfactory correspondence in the effects of the two remedies. May they not both be useful in that disease?

The great resemblance that I perceived in myself, between the effects of mercury and of the nitric acid, made me anxious to know if the acid would remove the various symptoms of syphilis. In September, 1793, it was administered, at my desire, by my friend Mr. Anderson, surgeon of the 77th regiment, to a person who

had a head-ach that came on every night, and which had long been suspected to arise from lues. He had taken several courses of mercury on this account, which carried away all the uneasy symptoms; but they as constantly returned after a certain period. On using the acid for about a fortnight, he got perfectly free from his head-ach, and he remained very well for a few months, as was usual to him after mercury.

I have now had a pretty extensive experience of the good effects of the nitric acid in syphilis; and I have reason to believe, that it is not in general less effectual than mercury in removing that disease in all its forms, and in every stage of its continuance. I think that in some cases it has even superior powers; for I have succeeded completely with the acid, when mercury, administered both in this country and in Europe for years together, had failed of success. We appear to be able to carry the degree of oxygenation of the body to a greater length by means of the nitric acid, and to continue it longer than we can do by mercury.

A mass of mercury, in the circulation, produces many disagreeable effects, that make it often necessary to give over its use before it has answered its intention: but the nitric acid may be taken a long time without any material injury to the health; nor are its effects on the mouth, in producing inflammation, and a flow of saliva, so disagreeable as from mercury.

A man could hardly offer to his species a greater blessing than a new remedy against any of the host of diseases that assail us: but the reputation of specifics, with the exception of a few instances, has arisen only from the weakness of the human mind. Am I, too, deceiving myself, and attempting to lead others into error?

As the acid that I distil is not strong, and is of unequal strength at different times, I am regulated chiefly by the taste in giving it. I put half or three-fourths of a Madeira glassful of it in two pints of water, or I make two pints of water as acid as it can well be drunk. This quantity is finished every twenty-four hours, taking about a Madeira glassful only at a time.

I have sometimes removed syphilitic symptoms with the acid in five days; more commonly, I think, they give way in a fortnight; but sometimes, though seldom, they continue for twenty days without any apparent relief. I must confess, that in some cases I have failed altogether; but in those cases, mercury had long been given to little purpose; the bones were highly diseased, and the habit probably of a peculiar kind. I have cured syphilis with the acid, under a variety of forms, where no other remedy had ever been employed, and for above two years I have seen no relapse in those cases. I have administered it against the primary symptoms

of the disease, and I have given it for exostoses, for carious bones, for nocturnal pains, for eruptions and ulcers of the skin, and for all the train of misery that is attendant on lues. I have the pleasure to see, that several of my friends have begun to use the nitric acid in syphilis, and in other diseases. An account of their experience, which every body will esteem the most respectable authority, will make the subject of a future paper.

I hope this slight account will induce medical practitioners to try the effect of the nitric acid in syphilis, a disease which, in this climate, is so frequently the disgrace of their art. Too often the miserable wretch is but worn down sooner by the very remedies that are called in for his relief.

Quæsitæque nocent artes; cessere magistri,
Phyllirides Chiron, Amythaoniusque Melampus.
VIRG. GEORG. III.

ARTICLE II.

LETTER *from Dr.* RICHARD PEARSON.

(CIRCULAR.)

Birmingham, July 1, 1796.

SIR,

HAVING, for the last two years, prescribed the VAPOUR of VITRIOLIC ÆTHER to patients labouring under PHTHISIS PULMONALIS; and having, both in hospital and private practice, experienced the best effects from its use in this frequent and formidable disease, I am preparing to lay before the public a report of the cases in which it has been given, accompanied with remarks on some other remedies that may be employed with advantage in the cure of CONSUMPTIONS. Being desirous, in the recommendation of a new medicine, to have my own evidence supported by the concurrent testimonies of other practitioners, I take the liberty of calling your attention to this subject, and of submitting to your notice my method of using this application, which is simply this: I direct the patient to pour one or two tea-spoonfuls of pure or vitriolic æther (or of vitriolic æther, impregnated with cicuta, in the manner hereafter described) into a tea-cup or wine glass, and afterwards to hold the same up to the mouth, and draw in the vapour that arises from it, with the breath, until all the æther is evaporated. This is repeated three, four, or five times in the course of a day, for a month or six weeks, more or less, according

to circumstances.* The *first effects* of this application, are an agreeable sensation of coolness in the chest, an abatement of the dyspnæa and cough, and, after ten minutes or a quarter of an hour, easier expectoration. The *ultimate effects* (provided other proper measures be not neglected, for this is not to supersede the use of other medicines, but to be employed in conjunction with them) are, a removal of the local inflammation, a cleansing and healing of the ulcerated lungs, and a suppression of the hectic fever. To assert that all these beneficial consequences will flow from its application in every species and degree of phthisis pulmonalis, would be adopting the language of quacks, and insulting the understanding of every one experienced in the profession; but to say that some of these good effects are likely to result from its use in most instances, and most of them in a great number of instances, is only asserting what an experience of two years in a situation where the opportunities of making trial of it have been very frequent, has fully confirmed.

The salutary operation of æther, applied to the lungs in the form of vapour, I have found to be greatly promoted by several volatile substances that are soluble in it; but by none more so than by CICUTA. By macerating a sufficient quantity of the dried leaves of this plant in æther, for the space of three or four days, or at most a week, and occasionally shaking them together, a very saturated tincture is obtained, which may be inhaled in the same manner, and in the same doses as the pure æther. My proportions are a scruple, or half a dram, of the powdered leaves to every ounce of æther. The narcotic particles of the cicuta, conveyed in this manner along with the æther-vapour to the diseased lungs, act, as a topical application, with the best effect; hence, æther thus impregnated succeeds, in most instances, better than when it is employed alone. The only unpleasant circumstance attending the inhalation of this ætherial

* The loss of a part of the vapour, which is unavoidable in this mode of applying it, may be prevented, as a Medical Friend has suggested, by setting the tea-cup containing the æther in a small bason, and inverting a funnel over it. By applying the mouth to the tube of the funnel and making an inspiration, the patient draws in all the vapour along with the atmospheric air, which enters at the bottom of the funnel. In winter, the evaporation may be promoted, by setting the tea-cup in hot water; in which case the funnel is to be inverted, not into the bason containing the water, but over both tea-cup and bason, so as to rest immediately upon a table, tray, or plate, having a bit of double paper, or a quill, put under it, to allow the external air to enter more freely.

Children, and even infants, may be made to inhale this vapour, by wetting a handkerchief with æther, and holding it near the nose and mouth. It must be confessed, that this is attended with great waste; but in urgent cases of HOOPING COUGH and CROUP, in which it promises to be of use, this consideration can have little weight.

tincture of cicuta, is a slight degree of sickness and giddiness, which, however, soon go off.

It cannot be expected that I should here point out every symptom, or set of symptoms, which indicate or forbid the use of this application. I shall only remark, that it appears to be best suited to the florid, or what is commonly termed the scrophulous consumption. Where the pulmonic affection is complicated with mesenteric obstruction, or diseases of the other viscera, or a dropsical condition, it affords but transitory relief; and in the very last stage of the disorder, the proper time for using it is past.

Should you be induced, Sir, by this address, to make trial of the VAPOUR of VITRIOLIC ÆTHER, impregnated with CICUTA, in phthisical cases, I shall be glad to be favoured with your remarks and observations upon it, whether in its favour or not. All communications on this subject, are requested to be sent before *the first of January next*, as after that time the Treatise will be printed.

N. B. In CATARRHS, the æther-vapour, without the cicuta, succeeds very well. In these cases it is seldom necessary to continue the inhalation more than three or four days, or a week at farthest.

RICHARD PEARSON, *M. D.*

☞ The reader is desired to substitute the word *syphilis*, instead of "siphilis," wherever it occurs in pages 77 and 78.